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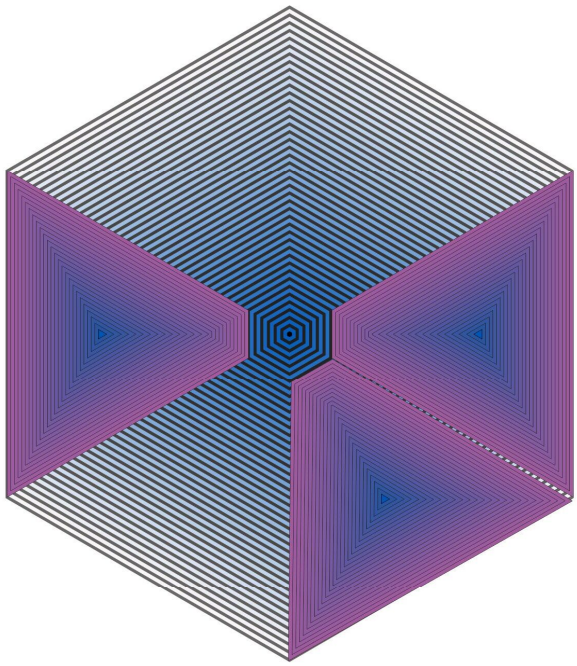

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FROM EDUCATION TO LIGHTNESS OF MIND

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Have you ever considered examining the connection between the educational process and the intellectual effort necessary for cognitive development? An interesting topic proposed to take a closer look at. More specifically, to see how education represents a whole complex of brain training, but also to identify the types of cognitive effort involved in this process, as well as how the character of the educable is shaped! On the other hand, an example is provided of how the process of simplification (usually a rather complicated endeavor) can lead to a shallowness of mind. Some studies indicate that education improves specific intellectual abilities rather than general intelligence (Peng & Kievit, 2020; Ritchie et al., 2015).

Each of us is aware that between education and mental effort is a fundamental interdependent relationship, the human mind needing challenges as well as sustained effort to reach its full potential. In this sense, the educational process, in its essence, is not just a process of passively accumulating information, but a way of actively and constantly training cognitive capacities. Without mental effort, learning becomes superficial and inefficient; without an educational framework to stimulate this effort, intellectual development stagnates. That's why we can safely define education as a serious training format for the brain... And the brain enjoys the great advantage of neuroplasticity, defined by the brain's ability to reorganize itself and form new neural connections throughout life. In other words, every completed grammar exercise, every solved math problem, every analyzed text, every decoded image, and every newly understood concept forces the brain to create and strengthen the neural connections. When we learn something new, a fragile neural connection is formed. But the much-valued repetition (from Latin we have the famous words: "*repetitio mater studiorum est*") and the effort to deepen the content proposed by the school strengthen this connection, transforming it from a simple "pathway" into a fast and efficient "highway". This is why, for example, problem-solving becomes easier with time.

But effective education must place the student in an optimal zone of difficulty. Tasks that are too easy to complete do not stimulate effort and do not lead happily to the development of students' skills, while tasks that are too difficult can lead to frustration and sometimes to dropout. Finding this balance is the art of pedagogy, which every teacher must follow - as Comenius said in *Didactica Magna*: "*The method of teaching must be treated as an art...*".

The educational process requires various forms of cognitive effort, each contributing to the development of specific skills: (a) sustained concentration (attention); (b) active memorization; (c) critical and analytical thinking; (d) problem solving and creativity. It is important to underscore the importance of diverse cognitive efforts–such as argumentation, reflective thinking, managing cognitive load, and metacognition–in fostering the development of specific skills during the educational process (Nugroho et al., 2025; Radulović et al., 2023). Here are some arguments for developing those skills:

(a) the ability to stay focused on a single task for a long period of time, ignoring external stimuli, represents a considerable effort. For example, going through complex content, listening attentively to a lecture, or working on a project are essential exercises for developing attention.

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b) Even though education is not just about memorization, the retention of fundamental information is necessary. However, the effort should not be in mechanical memorization, but in making logical connections between information, organizing it into mind maps, and integrating it into existing knowledge.
c) developing critical and analytical thinking is perhaps the most important type of effort, as it involves breaking down information, evaluating arguments, identifying premises and conclusions, and formulating one's judgments. For example, analyzing a literary text, evaluating a scientific experiment, or debating a geographical problem are activities that cultivate critical thinking.
d) applying theoretical knowledge to find solutions to practical problems requires considerable effort. Problem solving and creativity are ideally suited here, requiring mental flexibility, the ability to look at a problem from different angles, and to combine knowledge from a variety of fields to generate a new solution.

At the same time, overcoming the difficulties that arise in the learning process, through sustained effort, has a considerable impact not only on the cognitive level but also on the learner's character. In practical terms, the student builds resilience when he/ she makes a significant effort to understand a difficult concept and finally succeeds in doing so; he/ she learns a valuable lesson about perseverance. This experience will increase his/her confidence in the ability to overcome obstacles, a skill transferable to all aspects of life. In addition, the student will benefit from a growth mindset. People with a growth mindset believe that their skills can be developed through dedication and hard work. Education based on valuing effort encourages such a perspective, in contrast to a fixed mindset where intelligence is seen as an unchangeable given.

An important effort of the mind is involved in any spiritual exercise that takes place in a cultural setting. In this situation, we can define a clear goal: to reach a certain spiritual fulfillment, resulting in a certain satisfaction. This effort, which - often - is sustained, can be made easier simply by the tendency to simplify some cultural content. That is to make them explicit, more simply, more quickly, to achieve that spiritual satisfaction. At the same time, simplifying complex content also represents a new effort - the mind must certainly be put to serious work to simplify things, thus making them clearer! Great pleasure and satisfaction derive from this attempt! It is like an exercise in unraveling a riddle. A mind that is not clear is a muddled, confused mind that cannot find peace!

But from this, a danger can arise: the lightness of the mind... In other words, the act of simplification can easily lead to superficiality of mind. And here is an example, which my good philosopher friend humorously recounts, allowing me to quote him approximately (Alexandru, 2025/Forthcoming): as higher education institutions in the 21st century are slowly becoming commercial companies, they need advertising and marketing techniques that are well thought out so that customers (i.e., future students) are satisfied throughout their studies and especially at the end of them... In one such marketing campaign conducted at a certain high school, students were so disinterested in what the university had to offer that they couldn't even concentrate on what they were being told... So... what can teachers from universities talk to such students about? At one point, a lady teacher (from an engineering faculty) was talking to those prospective students about the fact that during their studies, they would be revisiting the basics of Math, Physics, Chemistry, and Biology, emphasizing how important Food Science is. At one point, a tattooed, blank-eyed young man introduced a kind of question: "*Madam, I know what meat is, I know what an egg is, but do not take me for H, for O, and for all those things…, do you?*" And this is where the lightness of mind comes in... I mean, the young future high school graduate knows *the meat*, as well as *the egg*! When he sees a piece of meat or an egg on his plate, he knows them, he identifies them, smiling - for him, this process of identification is like solving a difficult math problem! He feels the pleasure of knowing, he knows the meat, he

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knows the egg, and this must be emphasized to those around him! He is not nobody; university admission is solved! But we do not have to talk about hydrogen or oxygen! Or about more complicated compounds that - surely - he cannot even pronounce! This is how the lightness of mind needs no great disturbance, for it is liable to crack! And it is not with texts or literature, but with practice: the batteries of experience must be charged - i.e., the meat, the egg must be identified, tasted, etc., but without talking about proteins or chemical formulae! Those issues are freaks for the mind and block it! This is no longer about the effort of the mind! Not even about simplification for clarification! Here we simply stop the mind, we amputate it!... And this is how the ankylosing of the mind in a light superficiality comes to be recognized as a great achievement!

Consequently, the link between education and mental effort is inseparable - it is vital! Education is not a simple transfer of data, but a dynamic process that challenges, stimulates, and shapes the architecture of thinking. A 2023 review article in *Problems of Education in the 21st Century* highlights the importance of nuanced, context-specific educational approaches that challenge students and foster active engagement, rather than passive reception of information (Memisevic et al., 2023). Mental effort is the mechanism through which learning produces development and reinforces competencies. Simplifications are welcome, making the mind explicit and even energizing, and satisfying the spirit! But beware: the act of simplification can easily lead to superficiality of mind! Simplification is a useful procedure (often), but it must be used with discernment. If it becomes an automatic and uncontrolled practice, it can turn thinking into a shallow mechanism, poorly anchored in reality. So, in the act of education, a great deal of balance is needed: knowing when to require students to simplify, and when to keep things complex!

References

Alexandru, P. (2025). *Rănile individuației. Educație și prăbușire* [The wounds of individuation. Education and collapse]. Cetatea de Scaun.

Memisevic, H., Biscevic, I., Hadzic, S., & Kuduzovic, A. (2023). Exploring current trends in education: A review of research topics in the *Problems of Education in the 21st Century* journal. *Problems of Education in the 21st Century*, *81*(2), 258–268. https://doi.org/10.33225/pec/23.81.258

Nugroho, A. A., Sajidan, S., Suranto, S., & Masykuri, M. (2025). The effects of socio-scientific inquiry based learning on students' problem-solving skills. *Journal of Baltic Science Education*, *24*(1), 149–168. https://doi.org/10.33225/jbse/25.24.149

Peng, P., & Kievit, R. A. (2020). The Development of Academic Achievement and Cognitive Abilities: A Bidirectional Perspective. *Child Development Perspectives*, *14*(1), 15–20. https://doi.org/10.1111/cdep.12352

Radulović, B., Dorocki, M., Olić Ninković, S., Stojanović, M., & Adamov, J. (2023). The effects of blended learning approach on student motivation for learning physics. *Journal of Baltic Science Education*, *22*(1), 73-82. https://doi.org/10.33225/jbse/23.22.73

Ritchie, S. J., Bates, T. C., & Deary, I. J. (2015). Is education associated with improvements in general cognitive ability, or in specific skills? *Developmental Psychology*, *51*(5), 573–582. https://doi.org/10.1037/a0038981

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TEACHERS' MORAL CAPITAL: LEVEL, DETERMINANTS AND DEVELOPMENT STRATEGIES

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Abstract

This study investigates the level of teachers' moral capital, the factors influencing this perception, and strategies for its development. The research aims to determine teachers' moral capital levels, identify variables affecting their perceptions, and suggest improvements. A mixed-methods approach was employed, combining both quantitative and qualitative data. Initially, quantitative data were collected from 291 teachers through the "Moral Capital Scale," and later, qualitative data were gathered from 20 teachers via semi-structured interviews to deepen the understanding of the findings. The study population consists of teachers working in public schools in Gaziantep during the 2024–2025 academic year. The results show that teachers' perceptions of moral capital differ based on various personal and contextual factors. Key elements associated with higher moral capital perceptions include teachers' respect for their profession, commitment to ethical values, awareness of their role in students' development, and their ability to serve as moral role models. Additionally, variables such as marital status, age, socio-economic background, and length of service at a school also influence moral capital perceptions. Based on these findings, several recommendations are made: increasing teachers' awareness of moral capital, developing empathy and moral sensitivity, adhering to justice and consistency, utilizing professional development opportunities, enhancing the school climate, and maintaining cultural values and traditions. These strategies aim to strengthen the moral foundation of the teaching profession and contribute positively to educational environments.

Keywords: *moral capital, teacher ethics, teacher morality*

Introduction

Throughout history, societies have sought to strengthen moral values and promote social cohesion through various approaches and mechanisms that have shaped their development. In this context, capital has become one of the key concepts playing a critical role in cultural formation. While capital is traditionally associated with financial elements, it is more broadly understood as the totality of resources that individuals and organizations possess to achieve their goals. Over time, capital has evolved into a multi-dimensional structure, encompassing social, human, intellectual, and moral aspects. Bourdieu (1986) has categorized capital into economic, social, and cultural types. Various researchers define economic capital as material assets, social capital as the values derived from social relationships and networks (Coleman, 1988; Putnam, 1995), and cultural capital as an educational investment that shapes an individual's knowledge, tendencies, and habits during the socialization process (Vryonides, 2007). Additionally, Valverde (1990) has introduced the concept of moral capital as a non-economic form of capital,

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describing it as the capacity to influence others and shape social structures through moral decisions and behaviours. In this regard, elements such as peer groups, religious institutions, and family play a crucial role in fostering moral decision-making.

Moral capital refers to the network of trust-based relationships and attitudes that individuals and organizations build around ethical values. Schinkel and Ruyter's (2017) studies have revealed that moral capital has played a central role in the long-term development of both individuals and societies. In this respect, the development of moral capital requires a long-term investment (Lisenberg, 1991). Moral capital prevents social problems such as crime and violence (Godfrey, 2005), improves moral values (Çelik, 2014), and plays an important role in individuals' ability to distinguish between good and bad by using moral rules (Valvarde, 1990).

In the organizational context, moral capital aims for organizations to create a value-oriented culture and to make employee behaviours in line with ethical standards. Thus, it contributes to the institutionalization of moral values by increasing the intrinsic motivation of individuals. In this respect, moral capital has a critical role in increasing the productivity of organizations (Swartz, 1997; Wodka, 2017).

Focusing on the concept of moral capital in educational institutions can contribute to achieving the goals of the school and enable teachers to adopt core values and be positive role models for their students. In schools with teachers with moral capital, values such as tolerance, compassion, loyalty, forgiveness, peace, brotherhood, justice, and honesty come to the fore and constitute an important resource in the formation of a virtuous school (Sergiovanni, 1992; Sergiovanni, 2015). In this context, teachers with high moral capital are expected not only to provide students with academic knowledge but also to raise them as individuals equipped with moral values. On the other hand, teachers with low moral capital may damage students' sense of trust and negatively affect their motivation to learn. Teachers, as one of the key components of the education system, not only transfer academic knowledge but also play a critical role in imparting moral and ethical values to students. Moreover, it is thought that teachers with high moral capital can positively affect students' motivation to learn by increasing their sense of trust. Therefore, determining teachers' perceptions of moral capital can be seen as an important step in understanding their professional competences and their effects on students and improving the quality of the education system. Teachers' moral codes are critical for the educational process and the provision of education (Shahid et al., 2019). The importance of moral education is seen as an essential part of a country's educational curriculum. Teachers play an important role in terms of value education and moral education curriculum serves as the main tool (Zhang et al., 2022). Schools that successfully develop a moral community enable all individuals to contribute by valuing them. Teachers' personal vocation and professionalism are fundamental in this process (Tomlinson, 1997). Trust among teachers constitutes a "moral resource" for school improvements and is associated with increased innovation, access to parents, professional community, and commitment (Vodicka, 2006). The study highlights the key role of educators in instilling moral values, critical thinking skills, and civic responsibility among students, contributing significantly to the development of a society's human capital.

Research Problem

Studies on moral capital in education are highly limited. Upon examination, there are only a few studies on moral capital in Türkiye, primarily in the form of literature reviews on the development of moral capital in schools (Çelik, 2014), concept analyses of moral capital (Özgan & Akgül, 2018), the development of a moral capital scale (Akgül & Özkan, 2020), and the development of teachers' moral capital (Akgül, 2022). Furthermore, an analysis of international literature reveals that moral capital has been studied in the fields of sociology (Sherman, 2006; Swartz, 2013), moral regulation (Valverde, 1994), as a unifying concept (Silverstein et al.,

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2012), within the school development process (Gericke & Torbjörnsson, 2022), and in relation to the connection between moral thinking/reasoning and moral action (Kang & Glassman, 2010). In this context, this study aimed to identify teachers' perceptions of moral capital and determine strategies for its development. Additionally, teachers' commitment to professional ethical values has a significant impact on students, as the moral philosophy of a school is shaped by the moral philosophy of its teachers. Teachers who fail to serve as morally appropriate role models may contribute to a decline in a school's moral capital (Çelik, 2014). Therefore, in this study, the level of teachers' moral capital perception, the factors influencing this perception, and the necessary measures for its improvement have not been examined. Depending on the research findings, professional development programmes and in-school support mechanisms can be designed to enhance teachers' moral capital.

Research Focus

The research has focused on determining teachers' perceptions of moral capital, understanding the reasons underlying their perceptions, and identifying the necessary practices to enhance them.

Research Aim and Research Questions

The aim of this research was to determine the moral capital levels of teachers and to examine whether there are significant differences in moral capital levels according to various variables and what can be done to increase the moral capital levels of teachers:

1. What are teachers' general perceptions of moral capital?
2. What should be done to improve teachers' moral capital?
3. To what extent do teachers' perceptions of moral capital differ according to various demographic factors?
4. What have been the reasons for changes in teachers' perceptions of moral capital?

Research Methodology

General Background

This research was conducted using a sequential explanatory design, suitable for a mixed-method approach. In other words, both quantitative and qualitative research methods were used in this study. Combining these approaches can be highly productive, as each has its strengths and weaknesses. By using different methods to explore a phenomenon, researchers were able to obtain more comprehensive results (Patton, 2002). The study began with a quantitative phase, followed by a qualitative phase. Quantitative data formed the main framework, guiding the design and implementation of qualitative processes (Yıldırım, 2019). First, quantitative data were collected and analysed, and then qualitative data were collected and analysed to reveal the reason for the quantitative results (Creswell & Clark, 2015). In this research, following the sequential explanatory design, quantitative analysis first revealed that teachers' perceptions of moral capital whether there is a significant difference according to gender, marital status, education level, school level, tenure, teaching subject, age, professional seniority, socioeconomic background, or commitment to traditions. Qualitative data were then collected and analysed to explore the reasons behind these findings.

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Sample

The population of the study consists of teachers working in public schools in Gaziantep in the 2024-2025 academic year. According to the information on the official website of Gaziantep MEB, there are a total of 24263 teachers working in Gaziantep in the 2024-2025 academic year. A simple random sampling technique was applied to determine the sample. According to this technique, each sampling unit has the opportunity to be selected with equal probability from the population. In this method, the selection of one individual does not influence the selection of others, making it highly effective in ensuring representativeness (Büyüköztürk et al., 2019). In this context, the quantitative data of the study were obtained from 291 teachers. The sample size was determined using the G*Power 3.1.9.7 program, with an α value of 0.05, an effect size of 0.5, and a power (1-β) of 0.85, resulting in a required sample of 146. The final sample included 291 teachers who fully completed the data collection tools. Based on the G*Power analysis, this sample size sufficiently represents the population.

However, in the explanatory sequential design, it is recommended that qualitative data be obtained from the sample selected from the group in which quantitative data are collected (Creswell & Clark, 2015). Therefore, the qualitative study group was selected using maximum diversity sampling, a purposeful sampling method. This approach identifies common phenomena among diverse cases and aims to reveal different aspects of the problem. To ensure diversity, the teacher group was selected based on various factors, including gender, marital status, education level, school level, tenure, teaching subject, age, professional seniority, socioeconomic background, and commitment to traditions and customs. The qualitative data of the study were obtained from 20 teachers. Personal information about the study group from which qualitative data were collected and the sample from which quantitative data were collected are given in Table 1.

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Table 1

Sociodemographic Information of the Teachers Constituting the Sample and The Study Group of The Research

Demographic variables	Value	Sociodemographic Information of the Teachers Constituting the Sample (Quantitative)	Sociodemographic Information of the Teachers Constituting the Study Group (Qualitative)
		N	*N*
Gender	Female	164	12
	Male	127	8
Marital status	Married	189	13
	Single	102	7
Educational attainment	Bachelor's degree	237	13
	Postgraduate	54	7
School level of assignment	Kindergarten	15	1
	Primary School	203	15
	Lower-secondary	47	2
	Upper-secondary	26	2
Length of service at school	1-5 years	152	10
	6-10 years	79	5
	11-15 years	32	2
	16 years and over	28	3
Teaching subject	Preschool teacher	26	2
	Primary school teacher	176	13
	Special education teachers	89	5
Age range	22-30 years old	79	6
	31-39 years old	102	4
	40-48 years old	76	8
	49 years and over	34	2
Professional seniority	1-5 years	72	3
	6-10 years	66	4
	11-15 years	49	8
	16 years and over	104	5
Economic and Social Environment	Bad	48	4
	Medium	212	10
	Good and Very Good	31	6
Level of Adherence to Traditions and Customs	Little or Moderately Connected	241	14
	Tightly Bound	60	6
Total		291	20

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When Table 1 is analysed, quantitative data were collected from 291 teachers and qualitative data were collected from 20 teachers. In addition to the demographic variables in the table, it was thought that the economic and social environment and the level of commitment to traditions and customs may also be variables that may affect the perception of moral capital and that these variables should be investigated. It was noted that the variables in both the sample and the study group were similar. In addition, it was aimed to make the study group, in which qualitative data were collected, proportionally similar to the sample. While collecting data during the research process, the participants have first been informed about the study. This ensured that they voluntarily took part in the research. Prior to data collection, ethical approval has been obtained from the Gaziantep University Social and Human Sciences Ethics Committee (Approval No: E-62927161-302.08.01-572033, Decision No: 19, taken at Meeting No: 10 on 02.12.2024). Throughout the study, the personal information and rights of the participants have been protected, and instead of their names, assigned numbers and codes have been used. In this way, the principle of confidentiality has been maintained. Additionally, while collecting qualitative data, appointments have been arranged with participants, and data have been gathered in environments where they could express themselves comfortably. After transcribing the interview data, the transcripts have been sent back to the participants for confirmation. This process has ensured adherence to ethical principles in the study. In this way, ethical principles were complied with in the study.

Instrument and Procedures

In the study, "Moral Capital Scale," developed by Akgül and Özkan (2020), was used to determine the moral capital levels of teachers. This scale consists of five main dimensions, namely justice, empathy, responsibility, tolerance, and integrity, and a total of 20 items. The results of the Cronbach Alpha (α) analysis conducted to evaluate the reliability showed that the internal consistency coefficient of the scale was .871. When evaluated on a dimension basis, Cronbach's Alpha values of all dimensions were above .70. When the reliability of the scale was measured again in this study, it was found that the Cronbach's Alpha value was .85. According to Kılıç (2016), a Cronbach's Alpha value of .70 and above is considered sufficient for the reliability of the scale, while values of .81 and above are considered high reliability. In this context, it was determined that the scale had high reliability values both in the original study and in the current study.

In the study, a semi-structured interview form was used to determine what should be done to improve teachers 'moral capital and the reasons for the change in teachers' perceptions of moral capital. In the study, a semi-structured interview form was used to determine what should be done to improve teachers 'moral capital and the reasons for the change in teachers' perceptions of moral capital. The semi-structured interview form consists of two parts. In the first part of the form, there are questions to determine the purpose of the research and the demographic characteristics of the participants (gender, marital status, educational attainment, school level, working time in the school, teaching subject, age, professional seniority, economic and social environment, commitment to traditions and customs). In the second part, 8 open-ended questions were prepared as a result of the results obtained from the quantitative data in accordance with the purpose of the research. While preparing the draft of the interview form, the relevant literature was analysed. The draft form, consisting of these two parts, was sent to three academicians who are experts in the field of Educational Administration and have experience in related subjects to determine the content validity. In line with the feedback received from these academics, it was decided not to make any additions or deletions in the questions. The final version of the draft form was sent to two Turkish teachers for linguistic evaluation, and some statements were corrected in line with the feedback. In addition, pilot interviews were

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conducted with three teachers on the draft form, and the form was finalised. The final form was used as a data collection tool in the qualitative dimension of the study.

Data Analysis

Firstly, the data of 291 teachers were transferred to the SPSS 22 statistical programme used for data analysis by the researcher. After data entry, in order to decide which tests (parametric and nonparametric) to use, it was examined whether the data showed normal distribution. For this purpose, skewness and kurtosis values of the data were evaluated. The skewness and kurtosis values for the normality distribution of the data used in the study are given in Table 2.

Table 2
Measures of Central Tendency and Kurtosis-Skewness Coefficients of Variables

Moral capital and its dimensions	Skewness Coefficient	Kurtosis Coefficient
Moral capital (General)	-.40	.00
Justice	2.20	-1.01
Empathy	-.52	-.70
Responsibility	.83	-.24
Tolerance	-.36	-.30
Integrity	1.48	-.47

When Table 2 is examined, it is seen that the skewness coefficients of the variables vary between -0.52 and 2.20, and the kurtosis coefficients vary between -1.01 and 0.01. According to Jondeau and Rockinger (2003), skewness and kurtosis coefficients between +3 and -3 indicate that the data are normally distributed. In this context, it can be said that the data collected for the moral capital scale used in the research show normal distribution, and these data are suitable for parametric tests. In order to reveal the findings related to the sub-problems of the research, an independent sample t-test was used for pairwise group comparisons (such as gender, teaching subject), and a one-way ANOVA test was used for comparisons of more than two groups (such as age, tenure at school, professional seniority). In addition, Tukey post-hoc test was performed to determine from which groups the significant differences obtained in the ANOVA test originated.

After collecting and analysing the quantitative data of the study, qualitative data were collected for reasons such as making better sense of these data, examining them in depth, and explaining them in detail. Qualitative data were collected with an interview form based on the findings obtained from quantitative data. From the group in which quantitative data were collected, 20 teachers were selected on the basis of volunteerism with the maximum diversity sampling method. The interviews were conducted in teachers' schools and in a comfortable environment. The data obtained were analysed by the content analysis technique. MAXQDA software was used to analyse the data.

Validity and Reliability

In order to increase the internal validity of the research, the relevant literature was reviewed, and the interview form, prepared in line with the expert opinion, was applied to three teachers, and pilot interviews were conducted. In order to make the interviews more effective,

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the teachers were interviewed at their schools by making an appointment in advance. Necessary preliminary information was given to the teachers about the subject of moral capital. The duration of the interviews was kept as long as possible in order to create a safe communication environment with the teachers. At the end of the interviews, the participants were asked whether they wanted to make any additions or deletions, and the transcribed versions of the interviews were sent to them, and their approvals were obtained. Thus, verification was obtained from the participants. In order to increase the internal reliability of the research, care was taken to formulate the research questions in a clear, clear and understandable way. The questions were aimed to reflect the research accurately and to be consistent with the research. Data were collected in detail in accordance with the purpose and as required by the research questions. In order to increase internal reliability, consistency was checked with an independent coder. In order to increase the external reliability of the research, what was done in the process was explained in detail. In this context, how and where the interviews were conducted, how and with which methods the data were recorded, whether a programme was used in the analysis of the data obtained, and how the results were reported were stated in detail. The demographic information of the participants in the study is presented in a table. In addition, all these processes were recorded by the researcher so that they would be ready to be analysed by other researchers. It can be said that all these practices mentioned above are measures to increase the validity and reliability of the research (Arastaman et al., 2018).

Research Results

Teachers' General Perceptions of Moral Capital and What Needs to be Done to Improve their Moral Capital

The findings of teachers' perception levels of moral capital and its dimensions are given in Table 3.

Table 3
Values for Teachers' Perceptions of Moral Capital

Moral capital and its dimensions	*N*	$\bar{X}$	*SD*	Score range	Value
Moral capital (General)	291	3.87	.32	I agree	High
Justice	291	4.28	.55	Strongly Agree	Very High
Empathy	291	4.53	.49	Strongly Agree	Very High
Responsibility	291	4.23	.44	Strongly Agree	Very High
Tolerance	291	4.33	.43	Strongly Agree	Very High
Integrity	291	3.86	.62	I agree	High

Analysis of Table 2 revealed that teachers' overall perceptions of moral capital were within the "agree" range and generally high. Among the dimensions, the highest mean was found in the empathy dimension, while the lowest mean was in the integrity dimension.

As part of the second research question, teachers were asked about strategies to enhance their moral capital. The findings related to this question are given in Figure 1. In this context, when some of the teachers' views on why their perceptions of moral capital may be high were examined, P15 explained his views with the words *"The reason why teachers' moral capital level is high may be due to their commitment to their profession, their effects on students and the supportive school environment."* P11 said, "Teaching is a profession that is generally

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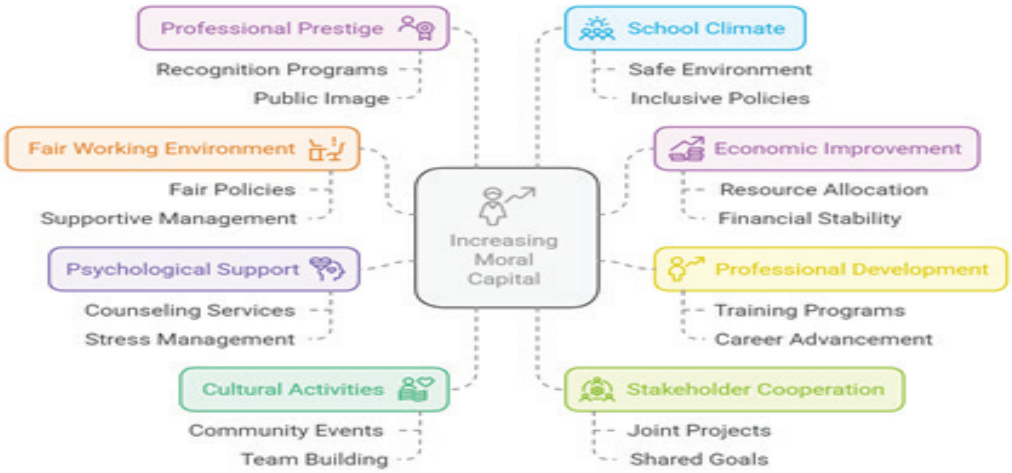
associated with telling the good, the beautiful, *and the truth. It is very difficult to do justice to this profession by seeing it only as a money-earning endeavour without being at a good moral level. For this reason*, *I think that people who prefer this profession choose it with this awareness*," expressed his thoughts with his words.

In the quantitative findings of the study, it was observed that the 'empathy' dimension had the highest mean and the 'integrity' dimension had the lowest mean. When the interviews conducted in order to explain the results of this finding are examined; P4 stated that *"There may be problems in grading, inconsistent behaviours may be displayed, sometimes we may think that children are older, although it is high in general, sometimes inconsistencies may occur."*, while P15 stated *that "Empathy is generally strong in teachers because it is important to understand the emotional needs of students. An empathetic teacher can support a student with family problems. In this respect, I think that teachers have this feeling*," expressed an opinion in the form of statements.

In the quantitative findings of the study, it was found that teachers' general perceptions of moral capital were high. In the interviews, the questions of what should be done to increase teachers' perceptions of moral capital to very high levels were asked. The answers given by the participants are given in Figure 1.

Figure 1
Findings on What Needs to be Done to Improve Teachers' Moral Capital



When the responses are analysed, teachers state that their perceptions of moral capital can increase if professional development is provided through trainings. However, they also expressed different opinions that could increase their perception of moral capital. When we look at the participant statements regarding these views; P13 "*We should make values education activities more concrete. Rich presentations can be made with group activity studies or workshops. MEB and the University can take part in joint studies. This can increase the moral capital of teachers. In this context, school, student and parent relations can become more efficient*.", while P12 stated that *"In order to increase the moral capital of teachers, various trainings can be organized for this field and its sub-dimensions, the contributions of increasing the moral capital of teachers to students, parents and other stakeholders can be explained to teachers with examples, teachers can have a clearer idea about the subject with case studies, teachers can be enabled to participate in various socio-economic activities, the economic level of teachers can be improved, museums and libraries can be given free leave to teachers*

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to increase their cultural and social data." P11 stated*, "Offering professional development opportunities, providing good working conditions, providing psychological support, and giving clear and positive feedback can increase their perception of moral capital."* Finally, P14 stated *that "Teachers' professional prestige should be increased, professional disinformation should be prevented, economic improvements should be made, teachers should be allowed to have one hour of class a week with an expert teacher even after internship, a meal, tea, guidance hour should be provided to provide a warmer environment in the teachers' room and alienation in the school should be prevented. If these are done, teachers' moral capital levels can increase,*" expressed an opinion in the form of statements.

When the findings obtained for the first sub-problem of the research are analysed, it is seen that teachers' general perceptions of moral capital are high and can reach very high levels in sub-dimensions. Teachers suggest various methods to further increase their general perceptions, and they think that the realization of these suggestions may be beneficial.

Teachers' Moral Capital Perceptions: Differences Across Demographic Variables and Underlying Reasons for Change

As a result of the quantitative analyses, it was determined that gender, education level, school level, teaching subject and professional seniority variables did not affect the perception of moral capital, while marital status, working time at school, age, economic and social environment, and commitment to traditions and customs were related to the perception of moral capital. The interviews conducted to reveal the reasons for these differences, and the tables related to quantitative data are given respectively. Whether the moral capital perceptions of teachers show a significant difference according to the gender variable was analysed by t-test and given in Table 4.

Table 4
Teachers' Perceptions of Moral Capital According to Marital Status Variable

Moral capital and its dimensions	Marital status	*N*	$\bar{X}$	*SD*	*df*	*t*	*p*
Moral Capital (General)	Single	102	3.81	.31	289	-2.02	.04
	Married	189	3.89	.32			
Justice	Single	102	4.14	.59	289	-3.19	.001
	Married	189	4.35	.51			
Empathy	Single	102	4,20	.47	289	-.60	.54
	Married	189	4.24	.42			
Responsibility	Single	102	4.45	.52	289	-2.06	.04
	Married	189	4.58	.47			
Tolerance	Single	102	4.31	.41	289	-.51	.60
	Married	189	4.34	.44			
Integrity	Single	102	3.81	.63	289	-1.09	.27
	Married	189	3.89	.61			

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When Table 4 is analysed, it is determined that there is a difference in the general perceptions of the teachers participating in the study with the justice and responsibility sub-dimensions of moral capital. When the arithmetic averages were analysed to determine the source of this difference, it was seen that married teachers had a significantly higher average of justice and responsibility sub-dimensions and general perceptions of moral capital. As a result of the qualitative interviews conducted to explain the reason for these findings, the teachers were asked to explain why the general perceptions of moral capital, justice, and responsibility sub-dimensions of married teachers might be higher. When we look at the participant opinions regarding this situation, P11 *said, "Since married people experience situations such as responsibility and empathy in their own lives, this inevitably reflects on their work life. I also think that having children has a significant effect on moral capital. I see that those who have children exhibit more sensitive behaviours than those who do not, especially in terms of tolerance and compassion."* P12 said, *"I think that married teachers have higher levels of moral capital. Whether it is the division of labour, responsibilities, the awareness of living together or acting justly, or the ability to solve the problems they face in marriage, it is reflected in their school life. I guess that responsibility and division of labour can be very effective in this regard, or I can say that showing consistent behaviours in raising children can cause similar reactions in students,"* explained his thoughts with his words.

Whether the teachers' perceptions of moral capital show a significant difference according to the variable of working time in the school was analysed by ANOVA test and given in Table 5.

Table 5

Teachers' Perceptions of Moral Capital According to the Variable of Working Time in the School

Moral capital and its dimensions	Length of Service at School	*N*	$\bar{X}$	*SD*	$F_{(3/287)}$	*p*	Meaningful Relationship
Moral Capital (General)	(1) 1-5 years	152	3.84	.34	1.26	.28	-
	(2) 6-10 years	79	3.87	.32			
	(3) 11-15 years	32	3.86	.31			
	(4) 16+ years	28	3.97	.27			
Justice	(1) 1-5 years	152	4.26	.51	1.63	.18	-
	(2) 6-10 years	79	4.28	.57			
	(3) 11-15 years	32	4.16	.71			
	(4) 16+ years	28	4.47	.46			
Empathy	(1) 1-5 years	152	4.51	.49	1.31	.27	-
	(2) 6-10 years	79	4.50	.49			
	(3) 11-15 years	32	4.57	.55			
	(4) 16+ years	28	4.70	.45			
Responsibility	(1) 1-5 years	152	4.18	.45	2.63	.05	1-4
	(2) 6-10 years	79	4.23	.43			
	(3) 11-15 years	32	4.27	.38			
	(4) 16+ years	28	4.42	.42			
Tolerance	(1) 1-5 years	152	4.31	.43	.39	.75	-
	(2) 6-10 years	79	4.36	.43			
	(3) 11-15 years	32	4.33	.42			
	(4) 16+ years	28	4.39	.44			
Integrity	(1) 1-5 years	152	3.85	.60	.15	.92	-
	(2) 6-10 years	79	3.89	.69			
	(3) 11-15 years	32	3.86	.58			
	(4) 16+ years	28	3.80	.51			

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When Table 5 is analysed, it is seen that the teachers' perceptions of justice, empathy, tolerance, and integrity among the sub-dimensions of moral capital and their general perceptions of moral capital do not show a significant difference according to the variable of working time in the school. However, it was found that there was a difference in the responsibility sub-dimension. When the finding was analysed with Tukey test, it was determined that teachers with a working period of 16 years or more had higher averages than teachers with a working period of 1-5 years. In order to explain the reasons for this situation, qualitative interviews were conducted, and the opinions of the participants were consulted. In this context, some of the participant views are as follows: P15 *"Teachers who have been working in the same school for a long time can better adapt to the dynamics of the school and exhibit a higher perception of moral capital in the dimensions of responsibility and integrity. A teacher who has been working at the same school for many years can exhibit a strong morale in the responsibility dimension by establishing a deep bond with the students."* P11 said, *"A teacher who has been working at the same school for many years is attached to that school wholeheartedly, and there are no reasons for him/her to strive to leave. This causes them to be more active and productive at school. Thus, they take more responsibility and have high moral capital."* P14 stated that *"A teacher who has spent many years at school has a more possessive, more empathetic, more tolerant structure and is able to analyse the students who reflect the profile of the place where he/she lives according to their socio-economic status."* While P19 stated that "*As a teacher's working time at school increases, he/she will integrate with his/her environment, parents, fellow teachers, and students and take responsibility in line with their expectations. This situation will increase his/her moral capital,*" expressed his/her views with the following statements.

Whether teachers' perceptions of moral capital show a significant difference according to the age variable was analysed by ANOVA test and given in Table 6.

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Table 6
Teachers' Perceptions of Moral Capital According to the Age Variable

Moral capital and its dimensions	Age	*N*	$\bar{X}$	*SD*	$F_{(3/287)}$	*p*	Meaningful Relationship
Moral Capital (General)	(1) 22-30 years old	79	3.80	.35	1.70	.16	-
	(2) 31-39 years	102	3.89	.30			
	(3) 40-48 years old	76	3.89	.33			
	(4) 49+ years old	34	3.90	.29			
Justice	(1) 22-30 years old	79	4.23	.49	.32	.80	-
	(2) 31-39 years	102	4.28	.56			
	(3) 40-48 years old	76	4.31	.59			
	(4) 49+ years old	34	4.29	.57			
Empathy	(1) 22-30 years old	79	4.44	.50	1.66	.17	-
	(2) 31-39 years	102	4.57	.49			
	(3) 40-48 years old	76	4.53	.51			
	(4) 49+ years old	34	4.64	.45			
Responsibility	(1) 22-30 years old	79	4.14	.50	1.65	.17	-
	(2) 31-39 years	102	4.23	.38			
	(3) 40-48 years old	76	4.28	.45			
	(4) 49+ years old	34	4.30	.36			
Tolerance	(1) 22-30 years old	79	4.28	.48	.77	.51	-
	(2) 31-39 years	102	4.33	.39			
	(3) 40-48 years old	76	4.36	.45			
	(4) 49+ years old	34	4.40	.38			
Integrity	(1) 22-30 years old	79	3.73	.71	2.87	.03	1-2
	(2) 31-39 years	102	3.99	.57			
	(3) 40-48 years old	76	3.85	.54			
	(4) 49+ years old	34	3.78	.64			

When Table 6 is analysed, it is determined that the perceptions of justice, empathy, tolerance and responsibility, which are the sub-dimensions of moral capital, and the general perceptions of moral capital of the teachers participating in the research do not show a significant difference according to the working time in the school where they are employed, but there is a significant relationship in the integrity sub-dimension. When the finding was analysed with Tukey test, it was determined that teachers between the ages of 31-39 had higher perceptions in the integrity sub-dimension than teachers between the ages of 22-30. When the findings obtained as a result of the qualitative interviews conducted to explain the similarity or difference of these findings are examined; P3 stated that *"As age increases, the level of understanding children and consistency in behaviours improve due to experience. This can increase the ability to empathize with them. I think that, especially newly appointed teachers, cannot have this level of responsibility yet."* While P4 expressed his views as *"I think that teachers with more life experience will have higher levels of moral capital, so I think that teachers with higher age will behave more consistently and justly than younger teachers."* P6 said, *"Teachers' moral capital can increase with time and life experiences. I think it can especially affect the integrity dimension,"* stated the following opinion.

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Whether the moral capital perceptions of the teachers show a significant difference according to the economic and social environment variable was analysed by ANOVA test and given in Table 7.

Table 7

Teachers' Perceptions of Moral Capital According to The Economic and Social Environment in Which They Grew Up

Moral capital and its dimensions	Economic and Social Environment	*N*	$\bar{X}$	*SD*	$F_{(3/288)}$	*p*	Meaningful Relationship
Moral Capital (General)	(1) Poor Level	48	3.89	.29	3.46	.03	2-3
	(2) Medium Level	212	3.84	.32			
	(3) Good and Very Good Level	31	4.00	.35			
Justice	(1) Poor Level	48	4.28	.56	.26	.77	-
	(2) Medium Level	212	4.27	.54			
	(3) Good and Very Good Level	31	4.34	.61			
Empathy	(1) Poor Level	48	4.62	.41	1.71	.18	-
	(2) Medium Level	212	4.50	.50			
	(3) Good and Very Good Level	31	4.62	.56			
Responsibility	(1) Poor Level	48	4.20	.42	5.60	.001	1-3, 2-3
	(2) Medium Level	212	4.20	.43			
	(3) Good and Very Good Level	31	4.47	.45			
Tolerance	(1) Poor Level	48	4.37	.41	2.73	.06	-
	(2) Medium Level	212	4.30	.44			
	(3) Good and Very Good Level	31	4.49	.38			
Integrity	(1) Poor Level	48	3.93	.48	1.49	.22	-
	(2) Medium Level	212	3.82	.63			
	(3) Good and Very Good Level	31	4.01	.70			

When Table 7 is analysed, it is determined that the perceptions of the teachers participating in the research on justice, empathy, tolerance, and integrity from the moral capital sub-dimensions do not show a significant difference according to the economic and social environment variable. However, it was determined that there was a significant difference in the responsibility sub-dimension and moral capital general perceptions. When the finding was analysed with Tukey test, it was determined that teachers who grew up in a good or very good environment had a higher perception than teachers who grew up in a medium level environment, and in the responsibility dimension, teachers who grew up in a good or very good environment had a higher perception of moral capital than teachers who grew up in both low and medium level environments. The question of whether teachers' perceptions of moral capital differ according to the social and economic environment in which they were raised, and what the reasons for this may be, was asked. When the participant views on this situation were analysed; P14 stated*: "Of course it differs because it is related to how they gain identity. A conservative environment may exhibit a more conservative attitude while making sense of emotional intimacy towards students. This may positively affect their empathy and tolerance."*

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While P19 said, *"The environment in which a person is raised determines his/her ethical and moral values. This helps the formation of a person's character. Therefore, the level of moral capital of teachers may vary according to this factor.* The *perception of a teacher who grows up in a good environment may be higher for this reason."* P15 said, *"The moral capital of teachers may differ according to the economic and social environment in which they grow up. Teachers from an economically disadvantaged environment may be stronger in the empathy dimension by better understanding the difficulties of students. Teachers from more advantaged environments may be strong in terms of self-confidence and access to resources."* While P12 stated that *"It is very normal that the economic and social environment in which one grows up affects moral capital because it is not possible for the moral capital of a person who grows up in a good or very good environment not to be affected by that environment. As an example, it can be said that a teacher who grows up in an environment where everyone knows how to read and write and has at least a university degree will be more consistent and fairer in his/her approach to his/her students. On the other hand, I think that a teacher who grows up in an environment with a poor social economic level may have problems at the point of acting justly.*" Whether teachers' perceptions of moral capital show a significant difference according to the variable of commitment to traditions and customs was analysed by a t-test and given in Table 8.

Table 8

Teachers' Perceptions of Moral Capital According to the Level of Commitment to Traditions and Customs

Moral capital and its dimensions	Adherence to Traditions and Customs	N	$\bar{X}$	SD	df	t	p
Moral Capital (General)	Less or Medium	231	3.82	.32	289	-5.00	0.001
	Tightly	60	4.05	.28			
Justice	Less or Medium	231	4.22	.53	289	-3.43	0.001
	Tightly	60	4.49	.57			
Empathy	Less or Medium	231	4.49	.49	289	-2.49	0.001
	Tightly	60	4.67	.49			
Responsibility	Less or Medium	231	4.18	.43	289	-3.46	0.001
	Tightly	60	4.40	.41			
Tolerance	Less or Medium	231	4.28	.44	289	-3.80	0.001
	Tightly	60	4.52	.33			
Integrity	Less or Medium	231	3.78	.62	289	-4.35	0.001
	Tightly	60	4.16	.52			

When Table 8 is analysed, it is seen that there is a significant difference in the moral capital sub-dimensions and general perceptions of the teachers participating in the research. When this finding was analysed with Tukey test, it was found that the perceptions of those who were strongly committed to traditions were higher in all dimensions than those who were at a low or medium level. When the findings obtained as a result of the qualitative interviews conducted to explain the reason for these findings are analysed; P1 stated that *"There may be some differences in terms of commitment to traditions and customs. There are differences especially in those who grew up in the eastern and western cities. A more traditionalist understanding in the east may increase their level of moral capital."*, while P5 explained his views with the words *"People*

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who adhere to traditions and customs may have a higher level of moral capital because they tend to accept unconditionally.". P11 "*Under the influence of traditional values, teachers see their profession not only as a job but also as a duty to serve the society. Teachers who adhere to traditions usually receive strong support from family and society. This support can increase the motivation of teachers*." P12 "*I can say that teachers who are firmly committed to traditions and customs may be more consistent in their behaviours and in this respect, their moral capital may be higher*," explained his views with his words.

Discussion

The aim of the study was to determine the levels of moral capital among teachers and to identify what actions should be taken to enhance teachers' moral capital. Additionally, the study sought to examine whether teachers' perceptions of moral capital varied according to various variables and to explore the reasons for these differences. In line with this, the findings obtained from the research were evaluated in the context of the relevant literature and empirical studies, and recommendations were developed based on the results. In the study, it was found that teachers' general moral capital perceptions were high. As a result of qualitative interviews, it was determined that teachers' high moral capital perception was related to their respect for their profession, their awareness of contributing to the development of their students, their commitment to the ethical and moral values required by the teaching profession, and their desire to be role models for their students. Teachers saw themselves as role models who adopted ethical and moral values and transferred these values to students. In the literature, it is seen that teachers' commitment to professional ethical rules is guided by their own moral compass (Daniel & Sapo, 2020), and that teachers generally see themselves as role models for students (Demir & Köse, 2016). Pratiwi and Susilowati (2025) conclude that individual morality affects fraud and unethical behaviours. In addition, it is found that there is a relationship between teachers' professional ethical behaviours and their levels of moral judgement (Sakin, 2007), and that their empathic tendencies increase as their perceptions of professional competence rise (Kayacı, 2021). Furthermore, Imanipour (2012) emphasises that teachers should adhere to ethical principles, considering their role in students' moral development. Sütçü and Oral (2021) state that most teachers love their profession, experience high professional satisfaction, and value their work. It is also stated that improving teachers' pedagogical competences has positive effects on morale (Nellitawati, 2020) and lasting effects on students (Meliha & Demir, 2014). In contrast to these findings, Benti and Tarekegne (2022) indicate that teachers' morale is low, mainly due to a lack of confidence in their professional competence. They also point out that teachers' morale is affected by various factors, such as their relationship with the school principal, relationships with colleagues, salary, workload, curriculum issues, and the level of community support for education and schools.

In this study, based on quantitative data, it was determined that among the sub-dimensions of teachers' moral capital perceptions, the empathy sub-dimension had the highest mean, and the integrity sub-dimension had the lowest mean. In this context, it was concluded that teachers' empathic skills were developed, but their behaviours might have been relatively inconsistent. Similarly, Kayıkçı and Uygur (2010) emphasise that teachers focus on justice, tolerance, respect, and responsibility as core ethical principles. Stojiljković et al. (2012) stated that teachers demonstrate a high level of empathy. Meyers et al. (2019) also state that teacher empathy involves an effort to deeply understand students' personal and social situations, sensitivity to both positive and negative emotions of students, and the ability to respond to these emotions with compassion. In the integrity dimension, it was concluded that although it was generally high, inconsistencies were sometimes experienced in grading and decision-making processes. However, it was seen that suggestions were needed to increase the overall perception and sub-dimensions of moral capital perceptions.

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In this context, it is concluded that providing teachers with training on the concept of moral capital can increase their perceptions. It is also a supportive finding that the training programme implemented within the scope of Akgül's doctoral thesis can increase teachers' perceptions of moral capital. It is stated that improving the school climate is important in increasing the perception of moral capital by providing tolerance and a fair, supportive working environment. The research conducted by Hargreaves (1995) suggests that school cultures are associated with outcomes such as academic achievement and social cohesion and have positive effects on teachers. It was stated that improving the economic conditions of teachers and strengthening their psychological and social support would positively affect the empathy dimension, while cooperation with stakeholders could contribute to qualities such as tolerance, responsibility, and integrity. In addition, it was concluded that organising cultural and social activities and increasing teachers' professional prestige could increase their perceptions of moral capital in general. Bozyiğit and Kazak (2024) also state that teachers take more responsibility in a supportive environment with a positive school culture and climate. This may lead to the development of a sense of responsibility, which is one of the sub-dimensions of moral capital, and thus increase the perception of moral capital. Lee et al. (1999) draw attention to the importance of academic and social support provided by teachers for student achievement and school engagement. A supportive teacher believes in students' abilities, respects their thoughts, and encourages them to learn and take risks. Teachers' pedagogical competences are critical to creating a positive working environment and realising educational goals, as these directly affect work morale and motivation (Nellitawati, 2020).

In the study, it was found that married teachers' perceptions of the justice and responsibility sub-dimensions, as well as their overall perceptions, were higher than average. In explaining this result, it is concluded that married teachers develop more responsibility and empathy in their married life, experience feelings of tolerance and compassion more intensely, and therefore make fair behaviours a habit. Bulut and Düşmez (2014) state that the empathic skill levels of married individuals are higher on average than those of single individuals. Korkut (2019) finds that married teachers' perceptions of organisational happiness and justice are significantly higher than those of single teachers, which aligns with the current study. In a study conducted by Arvas (2020), it is stated that it is important for married people to behave in a fairer and more altruistic manner and to have high perceptions of responsibility and justice, both for their personal development and the quality of their relationships.

In the study, it was determined that teachers with 16 or more years of service had higher perceptions of responsibility than teachers with 1 to 5 years of service. As a reason for this situation, it is concluded that teachers are more satisfied at school due to taking more duties, they adapt better to the dynamics of the school, they establish a deeper bond with the students, and they act within the framework of integrity by recognising the socio-economic conditions of the environment well. Similarly, Kurşunoğlu and Tanrıöğen (2010) conclude that teachers feel more belonging and identify with their institutions as their working time in their schools' increases.

In the study, it was found that teachers in the 31-39 age range had a higher perception of honesty than those in the 22-30 age range. When teachers were asked the reason for this, it was found that as their age increased, approaching students and behaving consistently were considered more important due to experience. Zembat and Küsmüş (2020) conclude that teachers' classroom management skills and professionalism increase with age. Similarly, Gökyer and Koçak (2019) state that as teachers' age increases, the organisational citizenship behaviours they exhibit increase regularly, leading them to take more responsibility. Erdoğdu and Aydındağ (2013) conclude that as teachers' age increases, their institutional identification also increases. These results support the current research.

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In the study, it was concluded that teachers' perceptions of moral capital and the responsibility sub-dimension differed according to the socio-economic environment in which they were raised. Additionally, it was determined that teachers who grew up in good and very good environments had higher general perceptions than those who grew up in medium-level environments. In the responsibility sub-dimension, the perception of teachers raised in good and very good environments was higher than that of teachers raised in low and medium-level environments. The environments in which teachers grow up shape their characters and behaviours, with moral, religious, and ethical principles profoundly influencing their lives. Şengün (2007) identifies key psycho-social factors that determine individuals' moral development, including heredity, environment, family, school education, peer groups, religion, mass media, economy, and culture. Within this framework, it can be concluded that the socio-economic context of teachers' upbringing significantly affects their perceptions of moral capital. Furthermore, teachers perceive religion as a primary source of moral values and highlight the importance of moral education (Siddiqui & Soomro, 2022).

In the study, it was concluded that individuals who were strongly committed to traditions had higher perceptions in all dimensions compared to those who were less or moderately committed to traditions. When teachers were asked about the reasons for this result, it was concluded that people committed to traditions behaved more empathetically and consistently. Looking at the literature, similar findings show that traditions contribute to the construction of personal character and promote values such as responsibility, care, and gratitude (Suyitno et al., 2023). Traditions provide a sense of stability and foresight in people's lives by offering a clear framework for how individuals behave in various situations, leading to more consistent behaviour (Revyakina & Sakharova, 2023).

Conclusions and Implications

The findings of this study reveal that teachers' perceptions of moral capital vary depending on various factors. Teachers' respect for their profession, awareness of contributing to students, commitment to ethical values, and understanding of being a role model are among the main factors contributing to high perceptions of moral capital. Variables such as marital status, socioeconomic environment, age, and time spent at school are also determinants in teachers' perceptions of moral capital. Especially married teachers and those with long-term experience have higher levels of moral capital, and their empathy skills are improved. In addition, it has been concluded that the environment in which teachers grow up shapes their ethical and moral values, and in this context, their commitment to traditions and customs positively affects their perceptions of moral capital.

Based on the findings of the study, several recommendations have been developed to enhance the quality of education and support the professional development of teachers. First, it is suggested that future research should explore the concept of moral capital in greater depth by identifying the factors that influence it, examining its relationship with student achievement, evaluating the effectiveness of moral capital development programs, and adopting mixed-method research approaches. Teachers are encouraged to increase their awareness of moral capital, develop empathy, adhere to principles of fairness and consistency, engage in professional development opportunities, contribute positively to the school climate, and remain committed to cultural traditions and values. In addition, it is recommended that the Ministry of National Education design and implement policies that promote moral capital, revise teacher training programs to include ethical and moral dimensions, provide targeted training for school administrators, improve the overall school climate, strengthen support services for teachers, enhance their economic and social rights, and integrate traditional and cultural values into the educational system.

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Declaration of Interest

The authors declare no competing interest.

References

Ade, S. H., Wibowo, B. Y., & Kurniasih, P. (2025). Morality partnering as masterpiece of business performance. *Journal of Islamic Economics and Business IQTISHADIA, 17*(2), 351–76. http://dx.doi.org/10.21043/iqtishadia.v17i2.30216

Akbulut, E. & Sağlam, H., İ. (2010). Sınıf öğretmenlerinin empatik eğilim düzeylerinin incelenmesi [An investigation on levels of the emphatic tendencies of classroom teachers]. *Uluslararası İnsan Bilimleri Dergisi, 7*(2), 1068–1083.

Akgül, Ö. S., & Özkan, H. (2020). Moral sermaye ölçeği: geçerlik ve güvenirlik çalışması [The scale of moral capital: A reliability and validity study]. *The Journal of Academic Social Science Studies*, *13*(79), 95–112. http://dx.doi.org/10.29228/JASSS.37006

Akgül, Ö.S. (2022). *Öğretmenlerin moral sermayelerinin geliştirilmesine yönelik bir uygulama* [Yayımlanmamış Doktora Tezi]. (*An implementation to develop teacher's moral capital* [Unpublished doctoral thesis])*/* Gaziantep Üniversitesi, Gaziantep.

Arastaman, G., Öztürk Fidan, İ., & Fidan, T. (2018). Nitel araştırmada geçerlik ve güvenirlik: Kuramsal bir inceleme [Validity and reliability in qualitative research: a theoretical analysis]. *Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 15*(1), 37–75. http://dx.doi.org/10.23891/efdyyu.2018.61

Arvas, F. B. (2020). Family, values and religion: A theoretical approach. *Turkey Journal of Theological Studies*, *4*(1), 199–33.

Benti, N., & Tarekegne, W. (2022). The current state of secondary school teachers' morale competence to teach. *Cogent Education, 9*(1), 1–17 https://doi.org/10.1080/2331186X.2022.2154948

Bourdieu, P. (1986). *The forms of capital.* In J. G. Richardson (Ed.), *The form of capital in handbook of theory and resarch for the sociology education* (pp. 241–258). Greenwood Press.

Bozyiğit, Ü., & Kazak, E. (2024). Öğretmenlerin rol fazlası görev ve sorumluluk almak istememelerine ilişkin okul yöneticilerinin görüşleri [Opinions of school administrators on teachers' reluctance to take on excessive roles and responsibilities]. *Ulusal Eğitim Akademisi Dergisi*, *8*(1), 82–107. https://doi.org/10.32960/uead.1423938

Bulut, H., & Düşmez, İ. (2014). Öğretmenlerin empatik eğilim becerilerinin demografik ve mesleki değişkenler bakımından karşılaştırılması [A comparison of teachers' empathic tendency in terms of demographic and professional variables]. *Iğdır Üniversitesi Sosyal* Bilimler Dergisi, (5), 105–115.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2020). Eğitimde bilimsel araştırma yöntemleri (29. Baskı) [Scientific research methods in education (29th edition)]. Pegem Akademi.

Çelik, V. (2014). Okullarda moral sermayenin geliştirilmesi [Developing moral capital in schools]. *Eğitim ve Bilim*, *39*(174), 67–74. http://dx.doi.org/10.15390/EB.2014.1919

Coleman, J.S. (1988). Social capital and the creation of human capital. American Journal of Sociology*, 94*, 95–120.

Creswell, J. W. & Clark, V. L. P. (2015). *Karma yöntem araştırmaları: Tasarımı ve yürütülmesi.* (2. Baskıdan Çeviri). [Mixed methods research: Design and conduct. (Translated from 2nd Edition)] (Translation ed., Y. Dede ve S. B. Demir). Anı Yayıncılık.

Daniel, W., & Sapo, S. (2020). Teachers' perception of professional ethics and its impact on their professionalism. *American Journal of Educational Research, 8*(6), 400–410. http://dx.doi.org/10.12691/education-8-6-6

Demir, E., & Köse, M. (2016). Öğretmenlerin rol modelliği hakkında öğretmen görüşleri [Teachers' view on teachers' being a role model]. *Akademik Bakış Uluslararası Hakemli Sosyal Bilimler Dergisi*, *53,* 38–57.

Elikesik, M., & Alım, M. (2013). Sosyal bilgiler öğretmenlerinin empatik becerilerinin bazı değişkenlere göre incelenmesi [The investigation of empathic skills of social sciences teachers in terms of some variables]. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *17*(3), 167–180.

Erdoğdu, M. Y. & Aydındağ, Z. (2013). Öğretmenlerin kurumsal özdeşleşme ve bağlılıklarının algılanan yönetici davranışları acısından incelenmesi. *İstanbul Sabahattin Zaim Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 1*(2), 158–153.

Gericke, N., & Torbjörnsson, T. (2022). Identifying capital for school improvement: recommendations for a whole school approach to ESD implementation. *Environmental education research, 28*(6), 803–825. https://doi.org/10.1080/13504622.2022.2045256

Godfrey, P. C. (2005). The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of management review*, *30*(4), 777–798. https://doi.org/10.5465/amr.2005.18378878

Gökyer, N., & Koçak, O. (2019). Okul yöneticilerinin otantik liderlik davranışları ile öğretmenlerin örgütsel vatandaşlık davranışları ve örgütsel bağlılık düzeyleri arasındaki ilişki [The relationship between school leaders' authentic leadership behavior and teachers' organizational citizenship behaviors and organizational commitment]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, *54*, 382–414.

Hargreaves, D. H. (1995). School culture, school effectiveness and school improvement. *School effectiveness and school improvement*, *6*(1), 23–46.

Imanipour, M. (2012). Ethical principles in education. *Iranian Journal of Medical Ethics and History of Medicine, 5*(6), 27–41.

Jondeau E., & Rockinger M. (2003). Conditional volatility, skewness, and kurtosis: Existence, persistence, and comovements. *Journal of Economic Dynamics & Control, 27*, 1699–1737. https://doi.org/10.1016/S0165-1889(02)00079-9

Kang, M. J., & Glassman, M. (2010). Moral action as social capital, moral thought as cultural capital. *Journal of Moral Education, 39*(1), 21–36. https://doi.org/10.1080/03057240903528592

Kayacı, E. (2021). Din Kültürü ve Ahlak Bilgisi öğretmenlerinin empati eğilimlerinin çeşitli değişkenler açısından incelenmesi [Examining the empathy tendencies of religious culture and ethics teachers in terms of various variables]. *Kocatepe İslami İlimler Dergisi, 4(*1), 122–137. https://doi.org/10.52637/kiid.923780

Korkut, A. (2019). *Öğretmenlerin örgütsel mutluluk, örgütsel sinizm ve örgütsel adalet algılarının analizi* [Yayımlanmamış doktora tezi]. (*An analysis of teachers' perceptions of organizational happiness, organizational cynicism and organizational justice* [Unpublished doctoral thesis]). İnönü Üniversitesi, Malatya.

Lee V. E., Smith J. B., Perry T. E., Smylie M. A. (1999). *Social support, academic press, and student achievement: A view from the middle grades in Chicago*. Retrieved from http://ccsr.uchicago.edu/sites/default/files/publications/p0e01.pdf

Lissenberg, E. (1991). Incorporation of moral capital: Children 's moral judgments of crime and criminals. *Droit et Societe, 19*, 299–309.

Lumpkin, A. (2008). Teachers as role models teaching character and moral virtues. *Journal of Physical Education, Recreation & Dance, 79*(2), 45–50. https://doi.org/10.1080/07303084.2008.10598134

Meliha, K. & Demir, E. (2014). Students' opinions about teachers' role model. *International Journal of Social and Economic Sciences, 4*(1), 8–18.

Meyers, S., Rowell, K., Wells, M., & Smith, B. C. (2019). Teacher empathy: A model of empathy for teaching for student success. *College Teaching, 67*(3), 160–168. https://doi.org/10.1080/87567555.2019.1579699

Nellitawati, N. (2020). The influence of teacher pedagogical competence of teachers' work morale. *Journal of Counseling and Educational Technology, 3*(1), 29–33. https://doi.org/10.32698/xxxx

Olumuji, E. (2025). The intricate relationship between parents, teachers and media in their context of nation-building. *International Review of Humanities Studies, 10*(1).

Özdemir, S., & Sezgin, F. (2011). Primary school students' perceptions of principal and teacher support, perceived violence, and school satisfaction. *Inonu University Journal of the Faculty of Education, 12*(2), 181–199.

Özgan, H., & Akgül, Ö. S. (2018). Moral sermayeye ilişkin kavram analizi [The concept analysis of moral capital]. *EKEV Akademi Dergisi*, *73,* 451–468.

Patton, M.Q. (2002). *Qualitative Research & Evaluation Methods.* Sage Publications.

Pratiwi, N. P., & Susilowati, E. (2025). Unethical behavior mediates individual morality and religiosity on fraud. *Jambura Economic Education Journal, 7*(1), 31–43.

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Putnam, R. (1995). Bowling alone: America's declining social capital. *Journal of Democracy 6*(1), 65–78.

Revyakina, N., & Sakharova, E. (2023). Forming of personal sustainable behaviour in society. In E3S Web of Conferences (Vol. 420, p. 06002). https://doi.org/10.1051/e3sconf/202342006002

Sakin, A. (2007). *Okul öncesi öğretmenlerin mesleki etik davranışlar hakkındaki görüşleri ile ahlaki yargı düzeyleri ve öğretmenlik tutumlarının incelenmesi* [Yayımlanmamış doktora tez]. (*An analysis of pre-school teachers' views about professional ethical conduct with their moral judgment levels and teaching attitudes. Available from ProQuest Dissertations & Theses Global* [Unpublished doctoral thesis]). Marmara Üniversitesi, İstanbul

Schinkel, A. & de Ruyter, D. J. (2017). Individual moral development and moral progress. *Ethical Theory and Moral Practice*, *20*(1), 121–136. https://doi.org/10.1007/s10677-016-9741-6

Şengün, M. (2007). Ahlaki gelişimin psiko-sosyal dinamikleri [Psycho-social dynamics of moral development] *Ondokuz Mayıs Üniversitesi İlahiyat Fakültesi Dergisi*, *23*(23), 201–221.

Shahid, N. A., Akhter, N., & Malik, S. I. N. (2019). Professionalism as a moral code of secondary school teachers. *Global Social Sciences Review, 4*(1), 77–88. https://doi.org/10.31703/gssr.2019(IV-I).07

Sherman, J. (2006). Coping with rural poverty: Economic survival and moral capital in rural America. *Social Forces*, *85*(2), 891–913. https://doi.org/10.1353/sof.2007.0026

Siddiqui, R., & Soomro, K. A. (2022). Teachers' perceptions regarding moral education in private and public schools in Karachi: A comparative study. *Journal of Education and Educational Development, 9*(2), 229–252. http://dx.doi.org/10.22555/joeed.v9i2.664

Silverstein, M., Conroy, S. J., & Gans, D. (2012). Beyond solidarity, reciprocity, and altruism: Moral capital as a unifying concept in intergenerational support for older people. *Ageing & Society, 32*(7), 1246–1262. https://doi.org/10.1017/S0144686X1200058X

Stojiljković, S., Djigić, G., & Zlatković, B. (2012). Empathy and teachers' roles. *Procedia-Social and Behavioral Sciences,* 69, 960–966. https://doi.org/10.1016/j.sbspro.2012.12.021

Sütçü, N. D., & Oral, B. (2021). Öğretmenlerin mesleklerine yönelik tutumlarını yordayan değişkenlerin Chaid analizi ile incelenmesi [Examination of the Variables that Predict the Attitudes of Teachers towards Their Profession Using the CHAID Analysis] *Cumhuriyet Uluslararası Eğitim Dergisi, 10*(2), 799–824. https://doi.org/10.30703/cije.777377

Suyitno, I., Pratiwi, Y., Andajani, K., & Arista, H. D. (2023). The cultural meaning in ritual traditions for the character of osing people Banyuwangi, Indonesia. *Qualitative Report, 28*(7). https://doi.org/10.46743/2160-3715/2023.6156

Swartz, D. (1997). *Power and Culture: The Sociology of Pierre Bourdieu,* University of Chicago Press.

Swartz, S. (2013). 'Moral ecology ' and 'moral capital': tools towards a sociology of moral education from a South African ethnography. *Moral Education in sub-Saharan Africa*, 39–62.

Tomlinson, J. (1997). Values: The curriculum of moral education. *Children & Society, 11*(4), 242–251. https://doi.org/10.1111/j.1099-0860.1997.tb00033.x

Valverde, M. (1994). Moral capital. *Canadian Journal of Law and Society/La Revue Canadienne Droit et Société*, *9*(1), 213–232.

Vodicka, D. (2006). The four elements of trust. *Principal Leadership, 7*(3), 27–30.

Vryonides, M. (2007). Social and cultural capital in educational research: Issues of operationalisation and measurement. *British Educational Research Journal*, *33*(6), 867–885. https://doi.org/10.1080/01411920701657009

Wodka, M. (2017). Social and economic significance of moral capital. *Ethics in Economic Life*, *20*(4), 65–75. https://doi.org/10.18778/1899–2226.20.4.05

Yıldırım, İ. (2019). *Karma araştırma yöntemi.* In S. Şen & Yıldırım İ. (Eds.) Eğitimde araştırma yöntemleri (Pp. 317–332). [Mixed research method. In S. Şen & Yıldırım İ. (Eds.) Research methods in education (Pp. 317–332).]. Pegem Akademi.

Yıldız, E. (2016). *Öğretmenlerin meslek etik ilkelerine uygun davranma algılarının işe yabancılaşma-yaşam doyumu ve bazı değişkenler açısından incelenmesi* [Yayımlanmamış yüksek lisans tezi] (*The survey of teachers' perceptions of behaving in accordance with professional ethical principles alienation from profession in terms of life satisfaction and some other factors* [Unpublished master thesis]). Ahi Evran Üniversitesi, Kırşehir.

Zembat, R., & Küsmüş, G. İ. (2020). Okul öncesi öğretmenlerinin sınıf yönetimi becerileri ile mesleki profesyonellikleri arasındaki ilişkinin incelenmesi [Analyzing the relationship between preschool teachers' classroom management skills and occupational professionalism]. *Kastamonu Education Journal*, *28*(4), 1725–1739. https://doi.org/10.24106/kefdergi.3621

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Zhang, Q., Saharuddin, N. B., & Aziz, N. A. B. A. (2022). The analysis of teachers' perceptions of moral education curriculum. *Frontiers in psychology,* 13. https://doi.org/10.3389/fpsyg.2022.967927

Semi-Structured Interview Form

1-What is the level of moral capital of teachers (Low-Medium-High)? How did you come to this conclusion? Can you give an example?
2- Do you think teachers' moral capital differs in terms of the dimensions of "justice, empathy, responsibility, tolerance, and integrity (displaying consistent behaviour)"? In which dimension do you think it may be higher or lower? How did you come to this conclusion? Can you give examples?
3- Do you think teachers' moral capital may differ according to gender? How did you come to this conclusion? Can you give an example?
4- Do you think teachers' moral capital may differ according to their marital status? How did you come to this conclusion? Can you give an example?
5- Do you think teachers' moral capital may differ according to their educational background? How did you come to this conclusion? Can you give an example?
6- Do you think teachers' moral capital may differ according to the type of school they are assigned to? How did you come to this conclusion? Can you give an example?
7- Do you think that teachers' moral capital can differ according to their working time in the school they are assigned? How did you come to this conclusion? Can you give an example?
8- Do you think that teachers' moral capital can differ according to the branches they are assigned? How did you come to this conclusion? Can you give an example?
9- Do you think teachers' moral capital may differ according to their age? How did you come to this conclusion? Can you give an example?
10- Do you think teachers' moral capital may differ according to their professional seniority? How did you come to this conclusion? Can you give an example?
11- Do you think the moral capital of teachers may differ according to the economic and social environment in which they are employed? How did you come to this conclusion? Can you give an example?
12- Do you think the moral capital of teachers may differ according to their commitment to the traditions and customs they are assigned? How did you come to this conclusion? Can you give an example?
13- What do you think can be suggested to increase teachers' moral capital? What kind of contributions can this situation offer to stakeholders? Can you give an example?

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	MORAL CAPITAL SCALE	Strongly Disagree	Disagree	Undecided	I agree	Absolutely I agree
1	I have strong moral values.	1	2	3	4	5
2	I always tell the truth.	1	2	3	4	5
3	I make sure that my decisions are compatible with my values and beliefs.	1	2	3	4	5
4	I respect the beliefs and opinions of others.	1	2	3	4	5
5	I think I'm a fair man.	1	2	3	4	5
6	I base my judgement on justice and listen to the voice of my conscience.	1	2	3	4	5
7	I do not favour anyone in the expectation of benefit.	1	2	3	4	5
8	I put myself in the other person's shoes and try to understand them.	1	2	3	4	5
9	I give measured reactions to negative situations I encounter.	1	2	3	4	5
10	I do not reflect the problems I experience in my private life to my working life.	1	2	3	4	5
11	I share people's pain and joy.	1	2	3	4	5
12	I take responsibility in the execution of school activities.	1	2	3	4	5
13	I do not develop a negative attitude towards the student with whom I have a problem.	1	2	3	4	5
14	I guide my students.	1	2	3	4	5
15	I try to do things that make a difference in my field.	1	2	3	4	5
16	I take care to use public goods (electricity, water, etc.) carefully.	1	2	3	4	5
17	I take into account the criticism directed at me.	1	2	3	4	5
18	I can overlook people's little mistakes.	1	2	3	4	5
19	I trust people.	1	2	3	4	5
20	I also try to understand people whose opinions I disagree with.	1	2	3	4	5

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THE EFFECT OF CRITICAL THINKING PRACTICES ON DIGITAL FOOTPRINT

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Abstract

Individuals equipped with critical thinking skills are capable of evaluating the consequences of their actions in digital environments and ensuring their personal safety while actively using technology. This study aims to examine the impact of critical thinking practices on reducing the digital footprints of prospective teachers. The research was designed as a quasi-experimental study with a pretest-posttest control group model. The study group consisted of 66 pre-service teachers enrolled in the fourth year of the Social Studies Teacher Education Program in Türkiye during the fall semester of the 2022–2023 academic year. Over a five-week implementation period, the experimental group (n=32) received critical thinking instruction aimed at minimizing digital footprints, while the control group (n=34) continued with the standard curriculum. Data were collected using the "Survey on Higher Education Students' Use of Digital Media," a semi-structured interview form, and a peer assessment form, all developed by the researchers. The findings revealed a statistically significant improvement in the experimental group regarding digital footprint reduction. Additionally, data obtained from the peer assessments and interviews supported the quantitative findings, demonstrating the positive impact of critical thinking practices.

Keywords: *critical thinking, digital footprint, pre-service teachers, social studies teaching*

Introduction

Significant advancements in science and technology have considerably enhanced individuals' quality of life. While the active use of technology offers convenience and new opportunities, it has also introduced challenges, particularly related to security and privacy violations (Selwyn, 2010). Among the primary causes of these challenges are the digital footprints individuals leave behind in digital environments. Search histories, Location-Based Service (LBS) records, social media activities, Point-of-Sale (POS) data, and surveillance footage all contribute to digital footprints. These traces are valuable sources of information for governments, corporate entities, employers, and cyberbullies. Today, digital footprints are used by states to ensure national security, by corporations to expand their markets, by employers to screen candidates, and by cyberbullies to perpetrate harassment. However, most individuals remain unaware of their digital footprint and the potential long-term consequences. Thus, it is increasingly essential for individuals to develop competencies that allow them to manage and minimize their digital footprints. Education is considered a crucial tool in achieving this goal.

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This raises the question: How should digital footprint education be delivered? It is believed that thinking skills in general, and critical thinking in particular, can play a significant role in reducing digital footprints.

The 21st century, an era when individual aspirations have become globally interconnected, marks a turning point in both technological development and in breaches of security and privacy rights. Epochs such as the "network society" and "information society" have transformed human life through scientific and technological advances, moving much of daily activity into online environments (Castells, 2000; Recepoğlu & Ergün, 2017; Yıldız et al., 2021). As a result, personal information has become increasingly digitized, contributing to the expanding digital footprint of individuals and highlighting the importance of cybersecurity (Weaver & Gahegan, 2007). In such a context, individuals are expected to reflect on their digital actions, question the implications, and produce rational solutions to the problems they encounter online. Critical thinking skills, which involve the use of metacognitive strategies to solve problems and draw logical conclusions, are seen as essential in this process (Facione, 1990; Halpern, 1999).

Scholars widely agree that it is difficult to provide a singular, universally accepted definition of critical thinking (Dinuta, 2015; Masa, 2014). This may stem from its interdisciplinary nature and the varying perspectives of researchers. Dewey (1910) defines critical thinking as "a way of thinking that begins with the identification of a problem, continues with persistent inquiry based on relevant information, and culminates in self-reflection." Similarly, critical thinking has been described as the cognitive effort to analyze, focus on, and decide upon a course of action (Daud & Husin, 2004; Smith, 2003). Lipman (1988) emphasizes its evaluative dimension, viewing critical thinking as context and criteria-based judgment. Paul (2006) succinctly defines it as "thinking about your thinking while thinking about improving your thinking," highlighting both its cognitive and metacognitive elements. Ennis (1996) views critical thinking as "reasonable and reflective thinking focused on deciding what to believe or do," stressing its basis in observation, inference, and reasoning. Likewise, Siegel (1988) emphasizes that critical thinking involves the careful evaluation of beliefs, arguments, and actions.

In applying critical thinking, individuals learn to identify fallacious arguments, unsupported claims, and ambiguous statements, thereby distinguishing truth from misinformation (Burbules & Berk, 1999). The potential of critical thinking to promote questioning and logical reasoning may reduce one's digital footprint in online environments. Therefore, educational practices that nurture critical thinking are of critical importance (Harrell, 2011; Jones, 2015).

The educational origins of critical thinking can be traced back to Dewey (Ennis, 1991), who equated it with reflective thinking. Dewey regarded it as a catalyst for fostering individuals who are curious, analytical, socially responsible, and committed to universal values. Different educational approaches have emerged for cultivating critical thinking. One involves teaching critical thinking as a stand-alone course. This method, however, has been criticized for its limited scope and time constraints (Wright, 2002). The second, the integrative approach, embeds critical thinking across all subjects. Although it promises comprehensive development, it requires all educators to possess expertise in critical thinking, which presents practical challenges (Kökdemir, 2003; Wright, 2002). Nevertheless, both approaches are considered valuable, and pedagogical strategies such as the Six Thinking Hats, role-play, concept mapping, analogies, case studies, and problem-based learning are known to foster critical thinking (Bonk & Smith, 1998). Therefore, cultivating critical thinking is both possible and necessary across all educational levels and disciplines.

The Foundation for Critical Thinking, established in 1997, has promoted the integration of critical thinking into all levels of education (Eldeleklioğlu & Özkılıç, 2008). This foundation particularly supports higher education institutions in preparing students to be thoughtful and reflective citizens. In many Western universities, critical thinking is considered a core component of academic success (Moore, 2013). It is incorporated into university curricula through

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dedicated programs and projects. As such, critical thinking can serve as a vital component of digital footprint education.

We appear to be living in a time when George Orwell's phrase, "Big Brother is watching you," from his novel *1984*, is increasingly relevant. Technological advancements have enabled constant surveillance, mirroring Orwell's dystopia. In many countries, citizens are monitored by governments under the guise of ensuring public safety (EPIC, PI, 2002). Such monitoring is often criticized for infringing on privacy rights. Privacy risks are not limited to government surveillance; technological advancements themselves have created significant vulnerabilities. Cross-referencing databases allow access to individuals' personal data in a matter of hours (Golder & Macy, 2014). For instance, LBS allows individuals to find nearby amenities, but it also raises privacy concerns (Barkhuus, 2004; Taylor, 2003). Similarly, POS systems, while offering convenience, can be used to infer individuals' preferences, behaviors, and even political or religious affiliations (Curry, 1993; Raper et al., 1992). Social media, a major tool for communication and entertainment, has made it even easier to access personal information. As of 2022, 4.62 billion of the world's 7.91 billion people use platforms like Facebook, Twitter, and Instagram (We Are Social, 2022). User profiles often contain full names, birth dates, occupations, hobbies, and photos (Lambiotte & Kosinski, 2014), and they also reveal personal connections and interests. Such databases are valuable to states, employers, and corporations. A single photo posted online can hinder one's job prospects or, in the case of public officials, ignite national debate, such as the controversy surrounding Norwegian Justice Minister Emilie Mehl's swimsuit photos. As Beal (2008) aptly stated, "Google is a reputation engine rather than a search engine."

Digital transformation has deeply embedded technology into our lives, leaving digital traces often referred to as digital footprints (Uzule et al., 2024). These are defined as "information and data that individuals generate through intentional actions or passive interactions in online environments" (Thatcher, 2014). Digital footprints include social media activity, web browsing, emails, Bluetooth pairings, and LBS data (Chen et al., 2017). The Pew Internet and American Life Project categorizes digital footprints as either active (e.g., social media posts and websites created by users) or passive (e.g., data collected via cookies and search histories) (Madden et al., 2007). With technological evolution, the scope and nature of these footprints have broadened, often extending beyond individuals' direct control. For example, others may share a person's information or photos without consent.

Given that digital footprints are expected to grow in tandem with technological advancements, increasing awareness is crucial. Education can help young people understand the long-term consequences of their digital actions and learn how to cultivate a positive digital identity (Van Dijck, 2013). However, most educational systems do not offer dedicated courses on digital footprints. While related concepts are included in digital and media literacy courses, these references are often indirect. A designated course could empower students with the knowledge and skills to create and manage a positive digital identity (Van Ouytsel et al., 2014).

The importance of teaching what digital footprints are, their potential future consequences, and how to manage them cannot be overstated. Critical thinking, essential for autonomous living, lifelong problem solving, and informed decision making, is especially valuable in this context (Gega, 1986). Individuals with strong critical thinking skills are more likely to consider the implications of their online actions and to navigate digital environments safely and responsibly. Therefore, incorporating critical thinking into digital footprint education is essential. Universities, as institutions designed to foster independent and critical thinkers, play a central role. Yet, most lack dedicated courses on digital footprints, instead embedding the concept within science and technology curricula. Whether taught directly or indirectly, education on digital footprints must be supported by classroom activities that nurture critical thinking. As the intellectual hubs of society, universities bear the responsibility of cultivating

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awareness of digital footprints. Their mission to develop autonomous, responsible, and globally aware citizens requires that such awareness be integrated into higher education. This calls for a comprehensive educational process, particularly for pre-service social studies teachers, whose training spans multiple disciplines. Such a process should provide opportunities to practice critical thinking, participate in decision making, and find solutions to contemporary digital challenges.

The aim of this study was to examine the impact of critical thinking practices on reducing the digital footprints of pre-service teachers. Specifically, the research seeks to answer the following questions:

1. Is there a statistically significant difference in the digital footprint scores of pre-service social studies teachers who receive instruction through critical thinking practices compared to those in the control group?
2. What are the perceptions of pre-service social studies teachers regarding the use of critical thinking practices to reduce digital footprints?
3. How do pre-service social studies teachers assess each other in relation to the critical thinking practices aimed at reducing digital footprints?

Research Methodology

Background

The study was designed using a quasi-experimental pretest-posttest control group design. When the objective is to measure variables and determine the relationships between them, a quasi-experimental design incorporating pretest and posttest control groups is recommended (Çepni, 2014; Emaikwu, 2010). This design allows for the identification of experimental and control groups, the implementation of an intervention with the experimental group, and the evaluation of its impact on outcome variables (Creswell, 2021).

In this study, the quasi-experimental pretest-posttest control group design was employed to examine the effect of critical thinking practices on the dependent variable of digital footprint reduction. The experimental and control groups were assigned in an unbiased manner. A pretest was administered to both groups, after which the critical thinking intervention was applied exclusively to the experimental group. Subsequently, a posttest was conducted to assess the differences between the two groups.

To further support the research process, peer assessments were incorporated. Peer assessment is particularly valuable for evaluating group dynamics, as students engage in collaborative learning and communicate with their peers throughout the educational process (Lingard, 2010). Additionally, a semi-structured interview form was utilized to complement the quantitative findings and to gain in-depth, process-based insights from the students in the experimental group.

Thus, this study represents a quasi-experimental design that integrates both quantitative and qualitative methods to comprehensively support the research process and enable holistic data interpretation.

Participants

The convenience sampling method, a type of non-random sampling, was employed to determine the experimental and control groups of the study. In this approach, participants are selected based on accessibility and ease of participation (Frankel, Wallen, & Hyun, 2015). One of the researchers was responsible for teaching the “Media Literacy and Education” course during the 2022–2023 academic year to fourth-year students in the Social Studies Teaching

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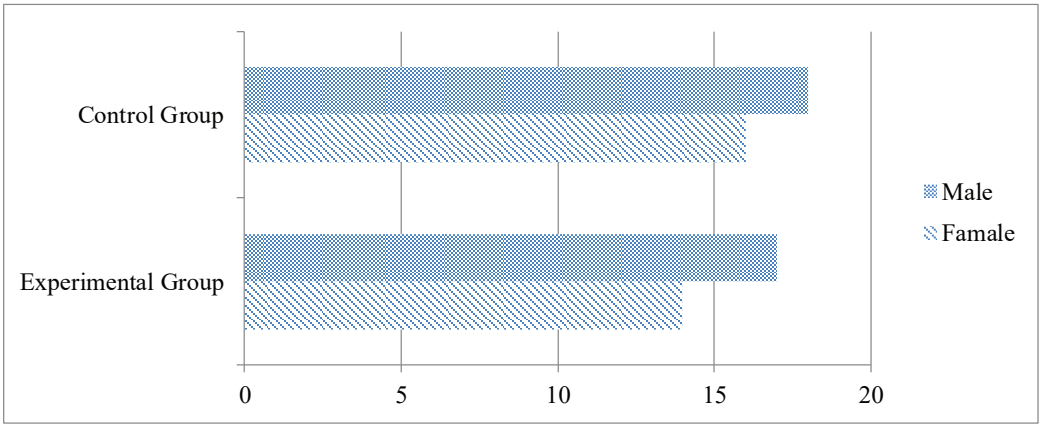
Department. The study was conducted with the voluntary participation of 32 pre-service teachers in the experimental group (eg) and 34 in the control group (cg).

The digital tools most frequently used by the participants included WhatsApp (eg: 32, cg: 34), Instagram (eg: 30, cg: 31), Spotify (eg: 29, cg: 28), Netflix (eg: 28, cg: 28), YouTube (eg: 32, cg: 34), Adobe Photoshop (eg: 25, cg:21) and Canva (eg: 30, cg: 29). The experimental group received instruction on Wednesdays from 11:00 to 12:30, while the control group attended classes on Thursdays during the same time slot. This scheduling was intended to control for variables such as timing, physical environment, and peer interaction across both groups. Descriptive information regarding the study group is presented in Figure 1.

Figure 1
Group Participants



Data Collection Instrument

In this study, the "Higher Education Students' Digital Media Usage Survey," a "Peer Assessment Form," and a "Semi-Structured Interview Form" were employed as data collection tools.

The "Higher Education Students' Digital Environment Usage Survey" was developed by Surmelioglu and Seferoglu (2019) to assess university students' digital footprint awareness and experiences and to offer recommendations for enhancing their awareness. The survey uses a 5-point Likert scale. The "Digital Footprint Awareness" dimension comprises 12 items with a reliability coefficient of .87, while the "Digital Footprint Experience" dimension consists of 16 items with a reliability coefficient of .78. Responses for the awareness dimension range from "Strongly Disagree" to "Strongly Agree," and for the experience dimension from "Never" to "Always." In the current study, the reliability coefficient for the "Digital Footprint Awareness" subscale was found to be .96, and for the "Digital Footprint Experience" subscale, .93. The overall reliability coefficient for the instrument in this study was calculated as .91.

The dimensions of digital footprint awareness and digital footprint experience in this questionnaire are aligned with critical thinking practices such as evaluating one's own digital footprint and examining overlooked elements like privacy settings. Furthermore, the content of the "Media Literacy and Education" course specifically, topics such as responsible internet and social media use, critical reading of media, and understanding propaganda techniques complement the digital footprint awareness dimension of the scale. Similarly, activities focusing on accessing information online and developing critical perspectives on written, visual, and auditory media support the digital footprint experience dimension in a holistic manner.

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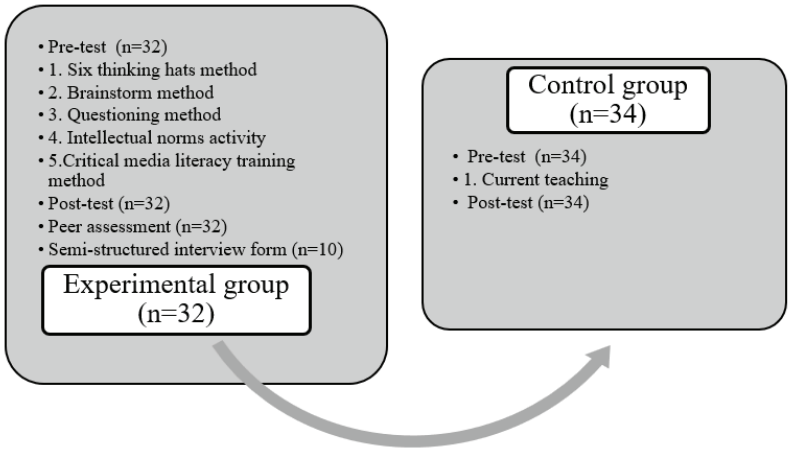
Peer Assessment Form: This form was designed by the researchers to assess the critical thinking practices of pre-service teachers in the experimental group related to reducing their digital footprints. The form was developed in line with the research objectives and relevant literature, and was revised based on feedback from two experts. The finalized version contains 10 items. Each item is rated as "Insufficient" or "Sufficient." The form was administered during the final week of the experimental process (week 8).

Semi-Structured Interview Form: This qualitative data collection tool was developed to explore students' perceptions of the intervention following the experimental process. The interview form was reviewed by two experts, one in Turkish education and one in social studies education, and revised accordingly. It includes five open-ended questions and was administered to a randomly selected sample of students from the experimental group in the final week (week 8) to provide deeper insight into the quantitative findings and to explore participants' perspectives on the process.

The Process Flow of the Study

Figure 2
Flow Chart Showing the Study Process


• Pre-test (n=32)
• 1. Six thinking hats method
• 2. Brainstorm method
• 3. Questioning method
• 4. Intellectual norms activity
• 5.Critical media literacy training method
• Post-test (n=32)
• Peer assessment (n=32)
• Semi-structured interview form (n=10)
Experimental group (n=32)
Control group (n=34)
• Pre-test (n=34)
• 1. Current teaching
• Post-test (n=34)

The implementation process of the study is detailed below.

Stage 1: The pilot study, including the entire process of data collection tools, was conducted within the scope of the "Media Literacy and Education" course. It involved 32 students from a different university, where one of the researchers was teaching the same course at a similar level. This pilot study took place in the first week of October 2022. The main implementation of the study was carried out with 66 pre-service teachers in November and December 2022. In this process, the students in the experimental group were first informed about the main methods used in teaching digital footprint and critical thinking. These methods included the Six Thinking Hats method, Brainstorming method, Questioning method, Intellectual Norms activity, and Critical Media Literacy training method. A pre-test was administered during the last week of November, and a post-test was conducted during the second week of December (week 8) for both the experimental and control groups.

Stage 2: During the first two weeks of November, the researchers delivered lectures on the topic of digital footprint within the context of the course objectives and the weekly lesson plan to the experimental group. Additionally, the students were briefed on the critical thinking activities to be implemented and were prepared for these activities. The students were instructed to form four groups, each consisting of eight members, for the following week (week 3).

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Stage 3: After the week of briefing on digital footprint and critical thinking activities, the aim was to develop questioning skills to cultivate critical thinking in student groups. To achieve this, within the scope of the weekly topic (Look at Your Digital Footprint), analytical questions were discussed using the questioning method. This was done to identify the main and sub-problems encountered during the process of accessing, analyzing, evaluating, and sharing data in the digital environment.

Stage 4: In order for students to develop a critical attitude toward the information disseminated by the media, questioning skills in critical media literacy education were practiced with the topic of the week (Which Websites Are Safe?).

Stage 5: The weekly topic (What Happens to Old Accounts in Digital Environments?) was addressed through a newspaper article, encouraging students to critically evaluate digital accounts. This activity allowed students to express the core problem using the depth norm study from the Intellectual Norms activities.

Stage 6: The objective was for students to become aware of the visibility of their private information, particularly in social media/online accounts. The topic of the implementation week (Overlooked Settings: Privacy Settings) was discussed using the Six Thinking Hats method, enabling students to consider all possible scenarios collectively.

Stage 7: The aim was for students to reflect on their actions in digital environments, both consciously and unconsciously. The lesson on the weekly topic (Keep My Digital Footprint Hidden) was conducted using the Brainstorming method, prioritizing the generation of a large number of ideas in a non-judgmental, free atmosphere.

Stage 8: At the conclusion of the critical thinking practices aimed at reducing the digital footprint, both the experimental and control group students completed the "Higher Education Students' Status of Using Digital Media Survey" as a post-test. Additionally, a Peer Assessment Form consisting of 10 statements was completed by the students in the experimental group. A semi-structured interview form was administered to 10 randomly selected students from the experimental group to gather in-depth insights.

Context

The education process in the Social Studies Teacher Education program consists of eight semesters (four years). The courses offered during this education process include pedagogical courses (e.g., Instructional Technologies, Political Science), elective courses in vocational knowledge (e.g., Drama in Education, Museum Education), general culture elective courses (e.g., Human Relations and Communication, Science and Research Ethics), and field education elective courses (e.g., Environmental Education, Information Technologies in Social Studies). Teacher candidates graduate by taking these courses in the relevant semesters (Council of Higher Education, 2018).

The research was conducted during the fall semester of the 2022-2023 academic year, within the scope of the "Media Literacy and Education" course, which is one of the field-specific courses in the program. In the "Media Literacy and Education" course of the Social Studies Teaching Undergraduate Program, teacher candidates are taught about the conscious use of the internet and social media, the power of disseminating information and misinformation, media and perception management, legal rights and responsibilities regarding the media and the internet, copyright, personal rights, information privacy, and the violation of privacy. Students also develop skills to access, analyze, evaluate, and convey messages in various media environments such as television, advertisements, the written press, and the internet. Furthermore, they learn to apply appropriate teaching skills for fostering a critical perspective toward written, visual, and auditory media. The course also covers media's effects on social, cultural, and economic life, with practical activities such as accessing information on

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the internet and critically reading media content and propaganda techniques (Council of Higher Education, 2018).

Data Analysis

An ANOVA test was used to assess the effectiveness of the experimental procedure in the experimental design with the pre-test and post-test control group.

The qualitative data of the study consisted of a semi-structured interview form and a peer assessment form. The qualitative data obtained were analyzed using the content analysis method. Responses regarding the categories and subcategories were explained in terms of frequency, and the statements of the prospective teachers were presented as direct quotes (e.g., "S1, S2, S3…"). To ensure the reliability of the data, it was analyzed by two different field experts, and the reliability coefficient was calculated as 89% using the reliability formula proposed by Miles and Huberman (1994). Thus, it can be concluded that the qualitative dimension of the study is reliable.

The data obtained from the peer assessment forms were analyzed and interpreted under the categories of "adequate" and "inadequate." The results were then analyzed in accordance with the research objectives.

Research Results

The results were obtained by applying the higher education students' digital environment usage survey to the students as a pre-test and post-test.

Higher Education Students' Status of Using Digital Media Survey

Table 1

The Mean and Standard Deviation Values of the Pretest-Posttest Scores of the Students on Students' Status of Using Digital Media Survey

Group	Pre-test			Post-test			Cohen's d
	N	$\overline{X}$	*S*	*n*	$\overline{X}$	*S*	
Experimental	32	75.62	4.60	32	89.53	14.83	.66
Control	34	71.88	4.40	34	80.63	25.17	

Table 1 shows that the pre-test mean achievement score of the experimental group students is M = 75.62, while the post-test mean achievement score is M = 89.53. In comparison, the pre-test mean achievement score of the control group students is M = 71.88, and the post-test mean achievement score is M = 80.63. Additionally, Cohen's d value was calculated as .66, indicating a medium effect size. Based on the statistical data obtained, it can be concluded that the digital footprint size of the experimental group students, who were instructed using critical thinking practices, decreased to a greater extent compared to the control group students, who were instructed using the current teaching methods.

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Table 2
ANOVA Results of Pre-Test and Post-Test Achievement Scores of Students on Students' Status of Using Digital Media Survey

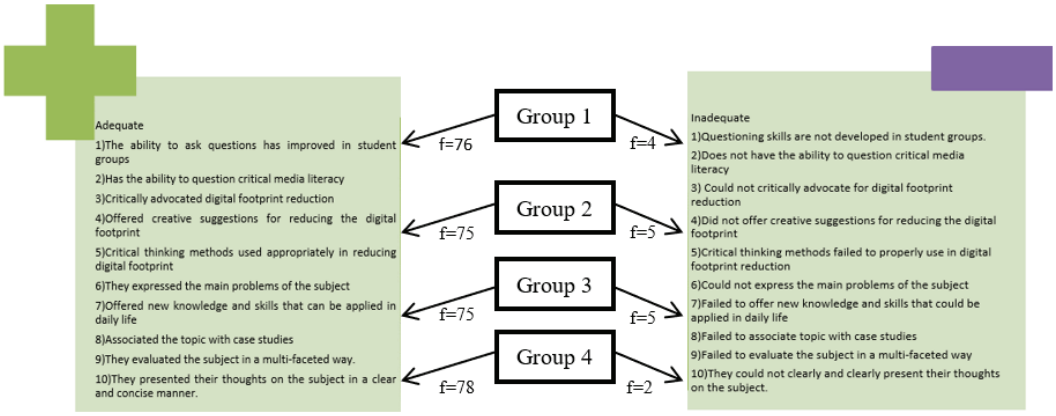
Source of variation	KT	SD	KO	F	p
Between groups	26,989,886	65			
Group (Experimental/Control)	694,909	1	1073,052	1,691	.0001
Error	26294,977	64	475,468		
Within groups	369,920	66			
Measurement (Pre-test-post-test)	1073,052	1	1073,052	58,378	.0001
Group*Measurement	1073,052	1	1073,052	58,378	.0001
Error	2146,104	64	8,168		
Total	36994,699	129			

When Table 2 is examined, a significant difference is found between the pre-test and post-test total scores of the experimental and control group students $F_{(1-64)}$ =.691; p<.05] A significant difference is also observed between the students' pre-test and post-test mean scores for digital footprint awareness [$F_{(1-64)} = .378; p < .05$].The common effects of repeated measures (pre-test and post-test) on the digital footprint scores of the students are significant due to being in different treatment groups (experimental-control) [$F_{(1-48)}$ =58.378; $p < .05$]. Based on these findings, it is evident that critical thinking practices directly influence students' digital footprint scores and are effective in reducing their digital footprints.

Results Regarding the Peer Assessment Form

Results were obtained from the peer assessment form given to the students in order to get peer opinions on their experiences in the implementation process.

Figure 3
Comparison of the Students' Experiences Regarding the Implementation process as Adequate and Inadequate as Expressed in the Peer Assessment Forms


Adequate
1)The ability to ask questions has improved in student groups
2)Has the ability to question critical media literacy
3)Critically advocated digital footprint reduction
4)Offered creative suggestions for reducing the digital footprint
5)Critical thinking methods used appropriately in reducing digital footprint
6)They expressed the main problems of the subject
7)Offered new knowledge and skills that can be applied in daily life
8)Associated the topic with case studies
9)They evaluated the subject in a multi-faceted way.
10)They presented their thoughts on the subject in a clear and concise manner.
Group 1
f=76
f=4
Group 2
f=75
f=5
Group 3
f=75
f=5
Group 4
f=78
f=2
Inadequate
1)Questioning skills are not developed in student groups.
2)Does not have the ability to question critical media literacy
3) Could not critically advocate for digital footprint reduction
4)Did not offer creative suggestions for reducing the digital footprint
5)Critical thinking methods failed to properly use in digital footprint reduction
6)Could not express the main problems of the subject
7)Failed to offer new knowledge and skills that could be applied in daily life
8)Failed to associate topic with case studies
9)Failed to evaluate the subject in a multi-faceted way
10)They could not clearly and clearly present their thoughts on the subject.

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The opinions of four groups of eight students (a total of 80 opinions) were compared based on the criteria of being "adequate" or "inadequate" in relation to the peer assessment form. The majority of the students in the groups assessed their peers as adequate throughout the application process. However, it is observed that some students in each group assessed their peers as inadequate during the process.

The peer assessment form consists of 10 criteria in total. The frequency (total of 80 opinions) of each criterion, assessed as "adequate" or "inadequate," was examined separately. When the frequency values of the 10 criteria were analyzed, the criteria for which students most frequently assessed their peers as "adequate" and had the highest frequency (*f*) were: "questioning skill regarding critical media literacy (*f* = 50)," "critically advocated digital footprint reduction (*f* = 52)," and "appropriately used critical thinking methods in reducing the digital footprint (*f* = 55)." The criteria for which students evaluated their peers as "inadequate" and had the lowest frequencies were: "could not associate the subject with case studies (*f* = 4)," "could not present thoughts on the subject clearly and unequivocally (*f* = 3)," "could not identify the main problems of the subject (*f* = 5)," and "questioning skills were not developed in student groups (*f* = 4)."

The peer assessment forms indicate that the experimental group students developed adequate critical thinking skills, such as questioning, multidimensional thinking, and asking analytical questions, through critical thinking practices aimed at reducing their digital footprints.

Results Regarding the Semi-Structured Interview Form

As a result of the semi-structured interviews, the students' opinions were categorized into five main themes: ("the impact of the applications on students," "the impact of the applications on reducing the digital footprint of students," "the students' approaches to media tools after the application," "the impact of the applications on the development of students' critical thinking skills," and "the impact of the students on their relationship with the applications used while engaging in digital environments in their daily lives"). Opinions in these categories were grouped according to their frequency (*f*). A student's opinion may be included under multiple categories.

Impact of the Applications on Students: When examining the effects of the applications on students, the majority of students expressed positive opinions about the application (*f* = 9). These positive views were associated with four subcategories: decision-making (*f* = 9), research skills (f = 7), developing different perspectives (*f* = 11), and problem-solving (*f* = 6). The subcategory most frequently mentioned was the development of different perspectives (*f* = 11). Regarding this, S5 commented, "It showed that it is important to approach problems, events, and situations from different perspectives." Concerning decision-making, S3 noted, "Before making a decision on a subject, it is necessary for me to make inquiries and access information or data on the subject to make the right decisions." Regarding research skills, S8 stated, "It allowed me to conduct research on the cause-effect relationship with all its dimensions by approaching the situation or problems holistically." On problem-solving, S4 said, "It showed that there can be more than one solution to a problem and that thinking about my own solution is one of the most correct ways of solving problems."

Impact of the Applications on Reducing the Digital Footprint: When asked about the effect of the practices on reducing digital footprints, the opinions expressed by students were categorized into four subcategories. The most commonly expressed view was that the practices provided "awareness raising" (*f* = 8). S9 expressed this as: "It created an awareness about what I need to do to reduce my digital footprint." Following this, "acquiring information" (*f* = 7), "multidimensional thinking" (*f* = 4), and "gaining inquiry skills" (*f* = 3) were also mentioned. Regarding acquiring information, S1 stated, "It showed that everyone in this world leaves a

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digital footprint consciously or unconsciously, and these traces can have direct or indirect effects on our social and economic life." S3 explained multidimensional thinking, stating, "It made me think about how I can shrink my digital footprint and what kind of results the digital footprint in the digital environment might have." Finally, on gaining inquiry skills, S5 said, "It awakened an awareness in me that people should question all their actions in the digital environment."

Impact of the Applications on Students' Approaches to Media Tools: When examining the effects of the applications on students' approaches to media tools, the majority of students expressed that the application led to "questioning the reasons why media messages are created" (f = 10). S9 remarked, "I now make effective decisions by making comments because media messages interest me." Some students indicated that the applications also made them more focused on "thinking about the striking elements in media messages" (f = 6) and "questioning the purpose of using media" (f = 4). S1 stated, "Now I question why I laugh at the messages and why the messages attract my attention."

Impact of the Applications on the Development of Critical Thinking Skills: Regarding the effects on students' critical thinking skills, positive views were categorized under three subcategories. The most common view was that the practices provided "creating a new approach" (f = 7). S5 commented, "All practices contributed positively to our critical thinking skills, as they enabled us to approach the subject with a critical perspective and showed that we could reach the right information through questioning." This was followed by "acquiring effective thinking skills" (f = 6) and "acquiring an evaluation process" (f = 3). Regarding the acquisition of effective thinking skills, S4 said, "As the practices led us to be mentally active in both problem-solving and accessing information, they positively influenced our critical thinking skills." S3, regarding multidimensional thinking, stated, "It made me think about how I can shrink my digital footprint and what kind of results the digital footprint in the digital environment might have." Finally, on acquiring an evaluation process, S8 explained, "We had the opportunity to review and evaluate both our friends' and our own ideas, especially when using the brainstorming and questioning methods."

Impact of the Applications on Students' Relationships with Digital Tools in Daily Life: The final category focused on the effects of practices on students' connections to digital tools in their daily lives. A commonly agreed-upon subcategory was "updating security settings in digital environments" (f = 9). S6 remarked, "I strengthened my password to increase the security of the mobile banking application on my phone, and I deleted some of my Twitter posts." S8 added, "After these applications, I organized my images and family photos on my social media so that only my friends could see them." Another subcategory was "reducing the footprint in digital environments" (f = 6). S1 commented, "I started to be more careful while downloading things on the Internet. I did not enter my personal information in every application, and I did not comment on social media." Lastly, in the subcategory "informing others about digital footprints" (f = 3), S4 said, "I also explained digital footprints to my family members."

Discussion

The main objective of this research is to determine the effect of critical thinking and related practices on reducing the digital footprint of prospective teachers. The study was informed by Lynn Thompson's (2012) assertion that "the footprints of the individual in the digital environment can be associated with the thinking and questioning skills of the individual." Critical thinking-based practices were applied with the experimental group to reduce the digital footprint. These findings form the quantitative results of the research and reveal significant outcomes. It was determined that the experimental group, which underwent critical thinking-based practices, differed from the control group, with the digital footprints of the experimental group students being reduced to a greater extent than those of the control group students who

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received conventional teaching. Furthermore, the emergence of a significant difference in favor of the post-test digital footprint scores for the experimental group serves as an important indicator that the critical thinking-based practices employed in the process were effective in reducing the digital footprint. The results obtained in this study are important in terms of demonstrating the effect of critical thinking on an individual's re-evaluation and review of the traces left by their activities in the digital world. This is because critical thinking is grounded in the effort to analyze the accuracy of outcomes and the process of mental filtering by examining various situations, events, or phenomena to reach valid conclusions (Halpern, 1996). When an individual initiates a mental process regarding the accuracy and consequences of their actions in the digital environment, they employ these skills. In other words, the critical thinking process begins within the individual. Open-mindedness, inquisitiveness, systematicity, analyticity, truth-seeking, self-confidence, and maturity dispositions associated with critical thinking also support this process (Facione et al., 1995). Individuals with critical thinking skills possess a distinctive character rather than specific skills. This character is based on seeking reasons, making judgments, and justifying one's actions with sound arguments, while rejecting partiality and arbitrariness (Siegel, 1990). In this context, an individual's ability to think critically and their effective use of these skills are vital for accurately evaluating the results of their digital footprint. The development of digital footprint technology, particularly in teacher education, will contribute to an effective educational environment that fosters professional skills and competencies, facilitates critical thinking, and expands the range of competencies (Pozdeeva et al., 2021).

The results obtained from the peer assessment form are noteworthy. A significant number of the pre-service teachers assessed their peers as having acquired a satisfactory level of critical thinking skills, such as questioning, multidimensional thinking, and asking questions in relation to reducing the digital footprint. Additionally, some pre-service teachers evaluated their peers as inadequate in criteria such as supporting their ideas with case studies, expressing their thoughts clearly and precisely, and stating the problem. These results can be attributed to the practices that enable individuals to acquire effective thinking skills and apply them in the digital world. Effective thinking skills, which are based on pre-service teachers' awareness of problems they currently face and those they may encounter in the future in the digital world, and their potential solutions, are a subcomponent of critical thinking. The skill that enables the acquisition of this awareness is critical thinking, which prioritizes questioning and research-based participation (Kuhn, 1999). This characteristic allows individuals to create an understanding process by questioning in every environment they participate in, both in the real and digital domains, while reducing the risk of their impact on the environment in the future. In the context of reducing the digital footprint, critical thinking is especially effective in finding answers to a question or problem situation (Ulu Aslan & Baş, 2022). Furthermore, pre-service teachers emphasized in the peer assessments that creative suggestions and critical thinking methods are effective in minimizing digital footprints. This outcome can be considered expected, as critical thinking involves not accepting the views expressed on any subject at face value, but instead examining and evaluating the process in which the individual is involved and creating a new perspective and route for themselves (Thomas & Lok, 2015). Critical thinking can be defined as the ability to question, verify, and evaluate thoughtfully before making decisions about a phenomenon (Ennis, 1989). This form of thinking can be effective in raising awareness of digital footprints and reducing them. Indeed, critical thinking requires individuals to possess various skills and metacognitive abilities, such as analysis, synthesis, comparison, and evaluation (Garside, 1996).

The results of the research indicate that the applications made a significant difference in the post-test data in favor of the experimental group, showing the impact of these applications on reducing the digital footprint of teacher candidates. The semi-structured interviews conducted to clarify this effect provided qualitative findings that support the quantitative data. As a result,

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it was determined that the practices based on critical thinking had a positive impact on reducing the digital footprint. These positive effects occur when critical thinking enables the individual to enhance the quality of their thinking skills by masterfully managing the structures within their thought system and imposing intellectual standards on these structures (Kurfiss, 1988). Critical thinking also plays a vital role in logical thinking, decision-making, and finding solutions to certain problems (Liu et al., 2014, p. 1). It offers opportunities to describe forms of cognition, analysis, and learning beyond mere memorization and recall of facts and information (Alhowail & Albaqami, 2024). The responses from the interview form are significant as critical thinking skills effectively increase digital footprint awareness through related aspects. Additionally, the research highlights the importance of awareness-raising activities at an early age concerning digital footprint awareness (Soylu et al., 2020).

The positive views and statements of the prospective teachers regarding the practices were positively reflected in the holistic evaluation of the research results. These findings, while supporting the quantitative data, reveal important insights into the awareness that critical thinking skills create in prospective teachers when interacting in digital environments. Indeed, critical thinking skills and practices emphasized in the context of 21st-century skills contribute to individuals' effective coping with "social, scientific, and practical problems" (Shakirova, 2007; Demirbaş et al., 2023). Self-awareness and environmental awareness, two of the most important features of critical thinking, are based on the self-direction and self-discipline of the individual in both real and digital environments, reviewing and verifying results (Paul & Elder, 2006). Thanks to this aspect of critical thinking, the desire to participate in interactions in the digital environment through digital tools is controlled by individuals, and the process is constantly questioned and re-evaluated. Furthermore, the fact that the students in the experimental group expressed the idea of "questioning the reasons for creating media messages" can be considered evidence of the effect of the inquiry-based approach of critical thinking on the pre-service teachers in the experimental group. Indeed, critical thinking involves identifying questions worth investigating, seeking knowledge by directing one's own efforts, pursuing problems through questioning, and providing evidence to support one's arguments (Pithers & Soden, 2000). The statement in the subcategory of "updating security settings in digital environments" reflects the prospective teachers' awareness of taking necessary precautions against the traces left by individuals in the environments they interact with in the digital world. This reference is an example of the reflection of critical thinking on information, thought, and practical literacy in daily life (Grafstein, 2017).

Conclusions and Suggestions

Branding the 21st century as a digital age directs individuals, especially the younger generation, toward the digital environment. Individuals leave traces in the digital environments they use, whether they are aware of it or not, and they cannot foresee the consequences it may bring. The focus of this study revealed that critical thinking practices had positive effects on reducing the digital footprints of pre-service teachers. In this context, several recommendations are presented below:

The effects of the digital world and participation in this world should be conveyed to pre-service teachers in a practical manner, considering the past, present, and future, in order to increase their awareness and attention levels.

The proficiency of pre-service teachers, who are the future educators, in methods that support critical thinking for reducing and managing digital footprints should be enhanced.

Scientific studies (e.g., articles, papers, books) focusing on the individual and societal effects of the digital world, while employing critical thinking and critical thinking practices, should be integrated into the academic community.

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Critical thinking skills aimed at reducing digital footprints can be applied not only in the Media Literacy and Education course but also in other courses across the curriculum.

Declaration of Interest

The authors declare no competing interest.

References

Alhowail, A. M., & Albaqami, S. E. (2024). Evaluation of the critical thinking skills of secondary school students in Saudi Arabia. *Problems of Education in the 21st Century, 82*(1), 7–28. https://doi.org/10.33225/pec/24.82.07

Barkhuus, L., & Dey, A. K. (2003). Location-based services for mobile telephony: A study of users' privacy concerns. *In Proceedings of Interact, 3*, 702–712.

Beal, A. (2008). Ten tactics that could save your online reputation. Mashable: The social media guide. http://mashable.com/2008/03/11/online-reputation/

Bonk, J., C., & Smith, S. G. (1998). Alternative instructional strategies for creative and critical thinking in the accounting curriculum. *Journal of Accounting Education, 16*(2), 261–293.

Burbules, N. C., & Berk, R. (1999). Critical thinking and critical pedagogy: Relations, differences, and limits. In Popkewitz, T. S., & Fendler, L. (Eds), *Critical theories in education.* Routledge.

Castells, M. (2000). *The rise of the network society*. Blackwell.

Chen, C., Chen, X., Wang, L., Ma, X., Wang, Z., Liu, K., & Zhou, Z. (2017). MA-SSR: A memetic algorithm for skyline scenic routes planning leveraging heterogeneous usergenerated digital footprints. *IEEE Transactions on Vehicular Technology, 66*(7), 5723–5736. https://doi.org/10.1109/TVT.2016.2639550

Council of Higher Education. (2018). *Social studies teaching undergraduate program.* Council of Higher Education Publications.

Creswell, J. W. (2021). *Introduction to mixed methods research* (3.th Edt.). (Trans. Ed. M. Sözbilir). Pegem A.

Curry, D. J. (1993). *The new marketing research systems how to use strategic database information for better marketing decisions*. John Wiley & Sons.

Çepni, S. (2014). *Introduction to research and project work* (7. baskı). Celepler Matbaacılık.

Daud, N. M., & Husin, Z. (2004). Developing critical thinking skills in computer- aided extended reading classes. *British Journal of Educational Technology, 35*(4), 477–487. https://doi.org/10.1111/j.0007-1013.2004.00405.x

Demirbaş, İ., Demirbaş, N. & Kahraman, E. (2023). Investigation of secondary school teachers' perceptions for 21st century skills. *International Social Mentality and Researcher Thinkers Journal, 9*(73), 3977-3985. http://dx.doi.org/10.29228/smryj.71008

Dewey, J. (1910). *How we think.* D.C. Heath.

Dinuta, N. (2015). The use of critical thinking in teaching geometric concepts in primary school. *Social and Behavioural Sciences, 180*, 788–794. https://doi.org/10.1016/j.sbspro.2015.02.205

Eldeleklioglu J., & Özkılıç R. (2008). The effect of critical thinking education on critical thinking skills of PAG students. *Turkish Journal of Psychological Counseling and Guidance, 3*(29), 25–36.

Emaikwu, S. O. (2010). *Fundamentals of educational research methods and statistics*. Deray Points Limited.

Ennis, R. H. (1996). *Critical thinking.* Prentice Hall

Ennis, R. H. (1989). Critical thinking and subject specificity: Clarification and needed research. *Educational Researcher, 18*(3), 4–10. https://doi.org/10.3102/0013189X018003004

Ennis, R. H. (1991). Critical thinking: A streamlined conception. *Teaching Philosophy, 14*(1), 5–25. https://doi.org/10.5840/teachphil19911412

EPIC, PI [Electronic Privacy Information Center and Privacy International] (2002). Privacy and Human Rights 2002: An International Survey of Privacy Laws and Developments. https://privacyinternationaI.org/survey/phrzoozJ

PROBLEMS
OF EDUCATION
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Vol. 83, No. 3, 2025

Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and ınstruction.* Research findings and recommendations The Delphi Report. https://files.eric.ed.gov/fulltext/ED315423

Facione, P. A., Giancarlo Sanchez, C., Facione, N., & Gainen Kurfiss, J. (1995). The disposition toward critical thinking. *Journal of General Education, 44*(1), 1–25.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2015). *How to design and evaluate research in education* (9th Edition). McGraw Hill Education.

Garside, C. (1996). Look who's talking: A comparison of lecture and group discussion teaching strategies in developing critical thinking skills. *Communication Education, 45,* 212–227.

Gega, P. C. (1986). *Science in elementary education*. John Wiley & Sons.

Golder, S. A., & Macy, M. W. (2014). Digital footprints: Opportunities and challenges for online social research. *Annual Review of Sociology, 40(*1), 129–152. https://doi.org/10.1016/B978-0-08-100673-3.00001-0

Halpern, D. F. (1996). *Thought and knowledge. An introduction to critical thinking* (3rd ed.). Lawrence Erlbaum.

Halpern, D. F. (1999). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *New Directions for Teaching and Learning, 80*, 69–74. https://doi.org/10.1002/tl.8005

Harrell, M. (2011). Argument diagramming and critical thinking in introductory philosophy. *Higher Education Research & Development, 30*(3), 371–385. https://doi.org/10.1080/07294360.2010.502559

Hendricks, C. (2006). *Improving schools though action research.* Pearson Education.

Jones, A. (2015). A disciplined approach to critical thinking. In Davies, M. & Barnett, R. (Eds.), *The Palgrave handbook of critical thinking in higher education* (pp. 169–182). Palgrave Macmillan.

Kökdemir, D. (2003). Decision making and problem solving in situations of uncertainty. (Unpublished PhD thesis). https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher, 28*(2), 218–239.

Kurfiss, J. G. (1988). *Critical thinking: Theory, research, practice, and possibilities.* ASHE-ERIC Higher Education Report No. 2. Washington, D.C.: Association for the Study of Higher Education.

Lambiotte, R., & Kosinski, M. (2014). Tracking the digital footprints of personality. *Proceedings of the IEEE, 102*(12), 1934–1939. 4. https://doi.org/ 10.1109/JPROC.2014.2359054

Lingard, R. W. (2010). Teaching and assessing teamwork skills in engineering and computer science. *Journal of Systemics Cybernetics and Informatics, 18*(1), 34–37.

Lipman, M. (1988). Critical thinking: What can it be? *Educational Leadership, 46*(1), 38–43.

Liu, O., Frankel, L., & Roohr, K. (2014). Assessing critical thinking in higher education: Current state and directions for next-generation assessment. Research Report. ETS RR-14-10. ETS Research Report Series.

Lynn Thompson, T. (2012). I'm deleting as fast as I can: Negotiating learning practices in cyberspace. *Pedagogy, Culture & Society, 20*(1), 93–112. https://doi.org/10.1080/14681366.2012.649417

Madden, M., Fox, S., Smith, A., & Vitak, J. (2007). Digital footprints. PEW Internet & American Life Project. http://www.pewinternet.org/Reports/2007/Digital-Footprints.aspx

Masa, S. (2014). The development of critical thinking in primary school: The role of teacher's beliefs. *Social and Behavioural Sciences, 141*, 387–392. https://doi.org/10.1016/j.sbspro.2014.05.068

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd Ed.). SAGE Publications.

Moore, T. J. (2013). Critical thinking: Seven definitions in search of a concept. *Studies in Higher Education, 38(*4), 506–522. https://doi.org/10.1080/03075079.2011.586995

Paul, R. W. (1992). Critical thinking: What, why, and how? *New Directions for Community Colleges, 1992(*77), 3–24. 4. https://doi.org/10.1002/cc.36819927703

Paul, R., & Elder, L. (2006). Mini critical thinking guide: Concepts and tools. http://www.criticalthinking.org

Pozdeeva, E., Shipunova, O., Popova, N., Evseev, V., Evseeva, L., Romanenko, I., & Mureyko, L. (2021). Assessment of online environment and digital footprint functions in higher education analytics. *Education sciences, 11*(6), Article 256. https://doi.org/10.3390/educsci11060256

Pithers, R., & Soden, R. (2000). Critical thinking in education: A review. *Educational Research, 42*(3), 237–49. https://doi.org/10.1080/001318800440579

Raper, J., D. W. Rhind., & J. W. Shepherd. (1992). *Postcodes: The new geography*. Longman Scientific and Technical.

Recepoglu, S., & Ergün, M. (2017). Perceptions of social studies teacher candidates about their classroom management skills. *Kastamonu Journal of Education, 25*(4), 1337–1352.

Selwyn, N. (2010). *Schools and schooling in the digital age: A critical analysis*. Routledge.

Siegel, H. (1988). *Educating for reason: Rationality, critical thinking, and education*. Routledge.

Smith, G. F. (2003). Beyond critical thinking and decision making: Teaching business students how to think. *Journal of Management Education, 27*(1), 24–51. https://doi.org/10.1177/1052562902239247

Soylu, M. Y., Demiröz, S., & Akkoyunlu, B. (2021). An ınvestigation of the digital footprint awareness and experiences of secondary school students. *Journal of Computer and Education Research Year, 9*(17), 177–198. https://doi.org/10.18009/jcer.838856

Surmelioglu, Y. & Seferoglu, S. S. (2019). An examination of digital footprint awareness and digital experiences of higher education students. *World Journal on Educational Technology: Current Issues, 11*(1), 48–64. https://doi.org/10.18844/wjet.v11i1.4009

Taylor, H. (2003, March 19). *Most people are "privacy pragmatists" who, while concerned about privacy, will sometimes trade it off for other benefits*. Harris Interactive. https://www.researchgate.net/publication/268342423_Most_People_Are_Privacy_Pragmatists_Who_While_Concerned_about_Privacy_Will_Sometimes_Trade_It_Off_for_Other_Benefits

Thatcher J. (2014). Living on fumes: Digital footprints, data fumes, and the limitations of spatial big data. *International Journal of Communication*, *8*, 1765–1783.

Thomas, K., & Lok, B. (2015). Teaching critical thinking: An operational framework. In M. Davies & R. Barnett (Eds.), *The Palgrave handbook of critical thinking in higher education* (pp. 93–105). Macmillan.

Van Dijck, J. (2013). 'You have one identity': Performing the self on Facebook and LinkedIn. *Media, Culture & Society*, *35*, 199–215. https://doi.org/10.1177/0163443712468605

Van Ouytsel J., Walrave, M., & Ponnet, K. (2014). How schools can help their students to strengthen their online reputations. *The Clearing House: A Journal of Educational Strategies*, *Issues and Ideas 87*(4), 180–185. https://doi.org/10.1080/00098655.2014.909380

We are social (2022). *Digital 2022: another year of bumper growth*. https://wearesocial.com/uk/blog/2022/01/digital-2022-another-year-of-bumper-rowth-2

Weaver S., & Gahegan, M. (2007). Constructing, visualizing, and analyzing a digital footprint. *Geographical Review*, *97*(3), 324–350.

Wright, I. (2002). Challenging students with the tools of critical thinking. *The Social Studies, 93*(6), 257–261. https://doi.org/10.1080/00377990209600175

Ulu Aslan, E., & Bas, B. (2022). Popular culture texts in education: The effect of tales transformed into children's media on critical thinking and media literacy skills. *Thinking Skills and Creativity, 47*. https://doi.org/10.1016/j.tsc.2022.101202

Uzule, K., Gobniece, Z., & Titko, J. (2024). Digital transformation of economies through technology, education and competences. *Problems of Education in the 21st Century, 82*(5), 758–774. https://doi.org/10.33225/pec/24.82.758

Yildız, İ. Topçu, E., & Kaymakci, S. (2021). The effect of gamification on motivation in the education of pre-service social studies teachers. *Thinking Skills and Creativity, 42*, 1–14. https://doi.org/10.1016/j.tsc.2021.100907

Yıldırım, A., & Şimşek, H. (2013). *Qualitative research methods in the social sciences.* Seçkin.

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LIBERAL AND COMMUNITARIAN MODELS OF CIVIC EDUCATION IN LITHUANIA AND ITS PRACTICAL IMPLICATIONS

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Abstract

In the face of evolving geopolitical tensions, digital transformations, and the emergence of new civic challenges – such as Russia's military aggression and the arrival of refugee communities – civic education in Lithuania has become a matter of renewed urgency. While traditionally centered on transmitting political knowledge, civic education increasingly plays a critical role in shaping civic virtues, values, and participatory attitudes. This research is dedicated to a question: how different models of civic education - liberal and communitarian - have influenced Lithuania's civic landscape since independence, and how these frameworks respond to current societal needs?

The study employs a comparative historical analysis of Lithuanian educational policies, civic participation trends, and socio-political contexts, tracing civic education's evolution from the communitarian mobilization of the Sąjūdis era to a liberal emphasis on individual autonomy and legal-rational governance. Data is drawn from policy documents, curriculum reforms, and secondary analyses of civic engagement indicators in Lithuania from 1990 to the present.

Findings reveal that while liberal models have institutionalized civic norms through rights-based education, they often fall short in fostering emotional engagement and community belonging. Conversely, communitarian models encourage solidarity and active citizenship but risk marginalizing individual freedoms. An integrative approach is proposed, combining liberal and communitarian elements to develop a civic education model aligned with Lithuania's present context, aimed at enhancing democratic resilience, social cohesion, and a participatory civic culture.

Keywords: *civic education, communitarian model, individual autonomy, liberal model, Lithuania, social cohesion*

Introduction

Recent geopolitical disruptions - including Russia's military aggression, the emergence of new refugee communities in Lithuania, and the rapid expansion of digital technologies and artificial intelligence - have renewed the urgency of civic education. These challenges have altered traditional forms of social solidarity, stretched institutional capacity, and exposed the limited civic agency of individuals and communities (Degutis et al., 2021; Democracy Index, 2020, 2023). As democratic societies confront complex uncertainties, a recalibration of citizenship and civic competence is needed - one that goes beyond technical skills to encompass moral judgment and emotional intelligence.

From the perspective of political sociology, civic education is more than the transmission of knowledge about democratic institutions. It involves the cultivation of civic virtues, values, and attitudes that guide social participation (Tocqueville, 1996; Walzer, 1989). Civic education, therefore, is not confined to the classroom or a subject area but functions as a foundational principle that permeates the entire educational process. As Stevenson (2001) has argued, civic

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education serves to transmit a society's shared cultural and political identity. A key concern, then, is whether civic education can reinforce civic continuity or promote democratic transformation (Janoski et al., 2005; Czyzewski, 2020).

This study examines the interaction of education with political, social, and cultural processes in Lithuania, with particular attention to how civic education has evolved since the country's independence. The analysis explores how educational frameworks shape both individual and collective identities by embedding shared values, social norms, and symbolic practices. In doing so, it reflects on the historical transition from a communitarian model of citizenship, dominant during the National Revival period (Furmonavičius, 2009), to a predominantly liberal framework emphasizing autonomy, rights, and procedural participation.

Civic education has been a topic of academic interest since Lithuania's independence, with researchers examining its shifting goals and pedagogical strategies in response to evolving political conditions (e.g., Balčiūnienė, 2007; Degėsys, Bakanas, & Simutytė, 2021; Lukšienė, 1992; Markelienė, 2005; Miseliūnaitė & Vaidelytė, 2018; Zaleskienė, 1998; 2003; 2004; Žiliukaitė et al., 2012). In addition, applied initiatives - such as the „Kuriame respubliką" [Making of the Republic] project and the „Moksleivių akademija" [Academy of Students] - have helped to shape civic competencies and participatory capacities in practice.

This paper contributes to that ongoing discussion by analyzing the ideological foundations and practical outcomes of civic education models in Lithuania and by proposing directions for future civic renewal grounded in both liberal and communitarian traditions. The central issue addressed in this research is not the acquisition of civic knowledge or the development of technical democratic skills, but the capacity of civic education to foster empathy, ethical leadership, and civic resilience. To that end, the research evaluates and compares liberal and communitarian models of civic education and assesses their practical implications for strengthening democratic culture in contemporary Lithuania. First, it provides a critical theoretical synthesis of liberal and communitarian models of civic education, contextualized within the Lithuanian post-independence experience. Second, it empirically maps the trajectory of civic education discourse and practice in Lithuania. Third, by employing a sociological lens, the research demonstrates the mismatch between formal civic education frameworks and the actual civic needs of Lithuanian society, particularly in light of new digital, generational, and geopolitical challenges. Most importantly, it proposes an integrative model that blends liberal and communitarian elements, emphasizing both democratic resilience and emotional solidarity, as a conceptual alternative to reimagine civic education for a more participatory and cohesive democratic culture.

Research Methodology

Design

This study employed a qualitative, descriptive research design to examine the evolution of civic education in Lithuania through the lens of liberal and communitarian theoretical models. The research is theoretical and documentary in nature and does not involve empirical data collection. It draws on political sociology and education theory to explore how civic education has developed over time and how it reflects broader sociopolitical and cultural shifts in Lithuanian society.

The study follows a comparative historical approach, focusing on the changing conceptual and ideological underpinnings of civic education from the period of National Revival in the late 1980s to the present Lithuania. It is primarily exploratory and analytical, aiming to clarify conceptual tensions and trace the practical implications of different models of civic education.

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Data Sources

The analysis was based on secondary sources and publicly available documents. The materials reviewed included:

- National education policy documents (e.g., General Programs for Civic Education).
- Strategic civic participation assessments (e.g., the Lithuanian Civic Empowerment Index and Democracy Index).
- Academic literature on civic education in Lithuania and internationally.
- Theoretical works on liberalism, communitarianism, and democratic education (e.g., Rawls, Berlin, MacIntyre, Sandel, Taylor).
- Reports and narratives from civil society initiatives (e.g., "Kuriame Respubliką," Civitas academies, and NGO project outputs).

Analytical Procedure

The analysis proceeded in three overlapping stages:

Comparative Historical Analysis - educational policies and civic education frameworks were reviewed across several decades to identify shifts in ideological orientation and practical emphasis. Attention was paid to key turning points, including Lithuanian independence (1990), EU accession (2004), and the post-2022 geopolitical climate.

Thematic Content Analysis - key themes were identified and coded from documents and literature, including autonomy, responsibility, solidarity, civic virtue, and engagement. These were mapped against the core tenets of liberal and communitarian models, allowing for a conceptual comparison.

Sociopolitical Contextualization - the thematic findings were interpreted within the broader context of societal change in Lithuania, drawing on political developments, trust in institutions, patterns of civic engagement, and public discourse. This provided insight into how educational practices intersect with wider social dynamics.

Reliability and Rigor

To enhance credibility and coherence, the study triangulated insights across multiple data types: policy documents, theoretical frameworks, and participation data. Concepts were analyzed consistently across historical periods and educational levels, ensuring analytical depth and thematic saturation.

Ethical Considerations

As this study was based exclusively on publicly available sources and theoretical analysis, it did not involve human participants or sensitive data. Therefore, ethical review was not required.

Research Results

The Evolution of Citizenship in the Period of Independence

The evolution of civic education in Lithuania during its Independence (since 1990) has been characterized by a dynamic interplay between national identity formation, European integration, liberalization, and responses to global and regional challenges. This process has reflected broader social changes, from the rejection of Soviet authoritarianism to the adaptation to

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a globalized and digital world, while continuously grappling with the need to balance individual freedoms with communal responsibilities. The early years of independence were marked by a strong emphasis on national revival and the re-establishment of Lithuanian identity, which had been suppressed during the Soviet era. Civic education during this period focused on fostering national consciousness, patriotism, and the values of independence, aiming to build a citizenry capable of sustaining the newly established democratic state (Lukšienė, 2000; Zaleskienė, 2004). Civic education also aimed to dismantle the remnants of Soviet authoritarianism by promoting democratic values, human rights, and civic participation, distancing the new democratic society from the authoritarian practices of the past (Cesiulis, 2006).

Later, Lithuania's integration into the European Union brought a shift in civic education towards the promotion of European values, such as pluralism, rule of law, and human rights (Spurga, 2008). Following EU accession, there was a gradual shift towards more liberal approaches to civic education, reflecting broader trends of liberalization in society (Šiliauskas, 2005). This period emphasized individual rights, personal autonomy, and the development of critical thinking skills, aligning with the values of a liberal democratic society. There was a growing need to address issues of economic inequality, social justice, and the integration of diverse social groups within the civic education framework (Šaulauskas, 2000**).**

Recent social trends, including political polarization and the erosion of social cohesion, have prompted a renewed emphasis on communitarian aspects of civic education (Švarplys, 2015). There is an increasing focus on fostering social responsibility, empathy, and community engagement to counteract the fragmentation of society. For example, in response to regional security concerns, particularly due to Russia's actions in Ukraine, civic education began to incorporate themes of national security, resilience, and the importance of civic duty in safeguarding democracy. On the other hand, the rise of digital technologies and the global shift towards the information society have led to the integration of digital literacy into civic education (Genys, 2023). This includes educating citizens on navigating digital spaces, combating misinformation, and engaging in digital forms of civic participation.

To this day, the current discourse in Lithuania experiences a tension between liberal and communitarian approaches to civic education. While there is still a dominant emphasis on individual rights and freedoms (Jokubaitis, 2017), there is a growing recognition of the need to cultivate a sense of community, shared values, and collective responsibility, especially in the face of global and regional challenges (Mikelić & Mažeikienė, 2019).

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Table 1
Interrelation Between Key Transition Periods and Main Contemporary Challenges for Civic Education

Relative geopolitical events	**Restoration of independence 1988-1992**	**Transition / Integration into the European Union (2004)**	**1st war in Ukraine 2014**	**Global pandemic / 2nd war in Ukraine 2019-2022**
Relative sociopolitical changes and public concern	Period of national revival, the struggle for independence. The transition from authoritarian system to democracy.	The period of integration with the West has been marked by a strengthening of democratic culture, with important reforms to adapt to the new principles of democratic governance.	Russia's aggression in Ukraine has raised the profile of regional security issues, which has led to a consolidation of authorities and public vigilance on security.	The pandemic changed political priorities and required rapid decision-making, increasing the power of the institutional network. The war in Ukraine mobilized the public for aid and prevention.
General public participation forms and attitude	Mass mobilization and participation, trust in society, and high hopes for the statehood	Decline in political participation but still high trust in political culture	Relatively low political participation, low trust in political institutions, but growing trust in governmental institutions, growing civic empowerment	Low political participation, low trust in political institutions, but strong governmental institutions and active civic activities, but shrinking civic empowerment
Civic empowerment index	ND	2007 m., 33,9. 2008 m., 33,2. 2009 m., 35.	2013 m., 36. 2014 m., 34 2015 m., 33,4.	2019 m., 39,7. 2020 m., 41,3. 2022 m., 35,9.
Relative contemporary challenges for citizenship/civic education				
Cultural identity, globalization, and economic inequality	Political polarization (disillusionment) and erosion of social cohesion	Moral and ethical education	Digitalization and changing educational priorities	
Globalization challenges to rediscover national and cultural identity, as international influences grow stronger. This is further complicated by economic inequality, which creates disparities in access to education. Students from less privileged backgrounds may find it harder to engage in civic life, leading to a fragmented sense of belonging and uneven participation across society.	Lithuania faces increasing political polarization and public disillusionment with political leaders, contributing to a decline in social cohesion. As trust in political institutions wanes, it becomes more difficult to build a unified society with shared values. This erosion of social bonds poses a significant challenge for civic education, which seeks to foster a sense of community and collective responsibility.	There is a pressing need to enhance civic education by focusing on moral and ethical reasoning. In a society where individualism often overshadows collective well-being, it is crucial to instill values such as empathy, integrity, and civic responsibility to prepare citizens who are not only knowledgeable but also morally engaged.	The rapid digitalization of society has transformed how citizens engage with information and each other. While digital tools offer new avenues for participation, they also introduce risks like misinformation and digital divides. At the same time, the increasing focus on STEM education and workforce readiness risks sidelining civic education.	

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The educational theorists who have studied post-Soviet situations, e.g., Apple (2001), have warned about the risks of a rapidly installed liberal system. According to the researcher, in countries undergoing rapid change, there is a risk of neoliberal policies (based on market economy values) becoming entrenched not only in the economic sectors, but also in the cultural or educational sectors. In such cases, there is a legitimate concern that the entire education system may find it increasingly difficult to fulfil its public good function and may drift more and more towards favoritism and inequality between privileged groups.

The changing values, norms and attitudes of society are inevitably reflected in citizenship education. As societies have undergone changes in governance, ideology and cultural practices, civic education has played a crucial role in promoting democratic values, tolerance, pluralism, and respect for human rights. Civic education programs have begun to emphasize the importance of civic virtues and active citizenship as fundamental principles for building an inclusive and democratic society in Lithuania. Despite progress, Lithuania's transition to democracy has been accompanied by challenges and tensions in the areas of political culture and civic participation. Issues such as political polarization and disillusionment with political elites have tested the resilience of democratic values and institutions, resulting in periodic fluctuations in civic engagement and public trust. However, in retrospect, some researchers have made rather strong generalizations, stating that "signs of disillusionment with the democratic system have become increasingly evident in society (not only a prevailing dissatisfaction with the way the new political system works, but also a much more dangerous belief that is widespread in society, Authoritarian rule can reverse the ineffectiveness of the problems of the existing government" (Žiliukaitė et al 2016). Liberal democracy seems to have liberated the individual but reduced the importance of the community (Taylor, 1996; Howard, 2003), which has led to a more active but less influential civil society.

The classical axiom of democracy states that civic identity is acquired through shared values and ideals as well as moral commitments, i.e., through being co-creators of society (Dahrendorf, 1990; Putnam, 2001). The gaze of civic education should be fixed on the future, because the historical narrative is not finished. By focusing not only on rights but above all on responsibilities, the idea of the common good emerges, which is what drives moral commitment. Civic maturity depends on social relations, social habits, and traditions of action, which do not emerge spontaneously. Civic education plays a vital role in nurturing this civic consciousness by providing individuals with the knowledge, skills, and motivation to participate in democratic processes, advocate for their rights, and contribute to positive social change. In this sense, the citizenship trajectories of Lithuania, as a post-Soviet and at the same time post-modern society, are very interesting: after escaping from the Soviet regime and finding ourselves in the post-modern era, we have adopted democratic procedures, but we haven't matured authentic civic skills (especially during the Soviet era) nor behavioral traditions. As already mentioned, the ideas of communitarianism, which guaranteed mass mobilization at the beginning of Independence, were quickly and effectively overshadowed by the principles of a liberal society. The circumstances of rapid change did not allow one to mature and experience the manifestation of communitarianism, but on the other hand, even the ideas of liberal democracy were more influenced by the laws of the market economy than by moral culture. Bearing in mind today's challenges to democracy, it is important to reflect on the confrontation between liberalism and communitarianism and highlight what each model can offer to the tradition of Lithuanian civic education and citizenship in general.

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The Relevance of Liberal and Communitarian Civic Education Models Addressing Contemporary Challenges

Civic education is of great importance from a political sociology point of view, as it plays a crucial role in shaping individuals' understanding of society, politics, and their roles as citizens (Janoski et al., 2005). Education is a key factor in socialization, exposing individuals to the norms, values, and practices of their society (Annette, 2000). Through formal education systems, individuals learn about the political structures, history, and civic duties that define their citizenship. Civic education contributes to the formation of political identity by shaping individuals' attitudes, beliefs, and values related to citizenship (Kymlicka, 1999). Civic education provides knowledge about political institutions such as government structures, legal systems and electoral processes, and the specific curriculum influences how individuals perceive their role in the political community. This understanding is essential for individuals to be able to participate actively in the political processes of their society in a concrete way.

The ongoing intellectual debate between liberalism and communitarianism has been a central theme in contemporary political philosophy (Dryzek et al., 2008) and sociology (Nash, 2010), as well as providing valuable insights for civic education theorists (Arthur & Bailey, 2000). It might as well serve as a productive stimulus in addressing specific challenges (like cultural identity, globalization and economic inequality, political polarization (disillusionment) and erosion of social cohesion, moral and ethical education, digitalization and changing educational priorities) that are undergoing contemporary Lithuania.

Cultural identity, globalization, and economic inequality. Globalization has spurred significant cultural exchanges while simultaneously intensifying concerns about the erosion of cultural identities and the exacerbation of economic inequality. From a political sociology point of view, small nations undergoing intense social change, communitarianism is considered as one of the most notable antidotes of this challenge. Taylor (1992) argued that respecting and nurturing cultural identities within educational frameworks is essential for fostering a sense of belonging in an increasingly globalized world. The researcher contends that the liberal focus on individual autonomy often neglects the cultural contexts that shape personal identities, leading to alienation and a weakened sense of community. MacIntyre similarly (1981), highlighted the importance of tradition and community practices, asserting that moral reasoning is inherently tied to the social contexts from which it emerges. For MacIntyre, civic education should not only emphasize cultural identity but also address economic inequality by fostering a shared sense of moral responsibility toward disadvantaged groups, ensuring a more equitable distribution of the benefits of globalization. Such argumentation is particularly relevant for Lithuania, where civic education could integrate a communitarian approach to promote a shared sense of moral responsibility and ensure that globalization benefits are more equitably distributed, particularly in rural areas or among minority groups. This could help civil society to become not only more vibrant but also powerful.

In contrast, liberal thinkers, particularly John Rawls and Milton Friedman, approach this challenge from the perspective of individual rights and opportunities. Rawls (1999) has advocated for civic education that equips individuals with the knowledge and skills necessary to navigate and thrive in a globalized economy. The researcher has emphasized the need for educational policies that address economic inequalities through the principles of justice as fairness, ensuring that individuals can compete on a level playing field. Meanwhile, Friedman (2002) has stressed the importance of economic freedom, arguing that educational approaches should prioritize individual economic empowerment. According to Friedman, civic education should enable students to fully participate in the global market, thereby enhancing their personal freedoms and economic opportunities. It is noteworthy that the idea - fostering personal freedoms and economic opportunities – was at the center of not only economic policy, but also liberation

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of society in general, almost since the beginning of Independence. It certainly rewarded us in multiple ways (i.e., personal freedom, market economy, rule of law etc.), however, in the last decade we witness a paradox, when using liberal argumentation (under the guise of a market economy and efficiency of the public interest), Lithuanian government has been pursuing centralism not only in many branches of state economy, but also education sector.

Political polarization (disillusionment) and erosion of social cohesion. The rise of political polarization and subsequent disillusionment with democratic institutions represent significant challenges to social cohesion. Communitarians like Michael Sandel and Michael Walzer argue that civic education must play a crucial role in fostering a strong sense of community and shared values. Sandel (2012) has criticized the liberal emphasis on individualism, suggesting that it undermines the communal ties necessary for a cohesive society. He has advocated for civic education that cultivates virtues binding individuals to their communities, promoting active participation in public life. Walzer (1983) has argued that justice is context-dependent and rooted in the values and practices of specific communities. The researcher has suggested that civic education should encourage dialogue and understanding among diverse groups, thereby addressing political polarization and strengthening social cohesion. Even though such an approach could be relevant for Lithuania, where the emphasis on community ties and active participation in public life could counteract the divisive effects of polarization, it is not popular. Context-dependent citizenship rooted in specific community values, strengthening social cohesion and mitigating polarization, is being perceived as an alternative citizenship, mainly as an effective counterpropaganda and counter manipulation tool (Mažeikis, 2010), however, it is not included in civic education programs as a reasonable and eligible approach.

Conversely, liberal thinkers emphasize the importance of protecting individual freedoms within a pluralistic society. For example, Isaiah Berlin (2002) warns against the dangers of enforcing a single communal vision, which could lead to the suppression of individual freedoms. He advocates for a civic education that promotes tolerance and respect for differing political views, thereby mitigating polarization through critical thinking and open dialogue. Rawls would support creating a civic culture that upholds fair and impartial institutions, fostering trust in democratic processes, and reducing disillusionment with the political system. The notion of promoting tolerance and respect for differing political views is essential in a society. The government especially promotes the idea of the importance of fair and impartial institutions, which could guide the development of a civic culture in Lithuania to uphold democratic processes, thereby reducing disillusionment with the political system[1]. However, as empirical evidence shows, it does not always have a positive effect on the power of civil society (Degutis et al, 2021).

Moral and ethical education. Moral and ethical education lies at the heart of the communitarian approach (as well as its critique of liberalism). MacIntyre (1981) has argued that contemporary moral discourse has become fragmented due to the liberal focus on individual autonomy, which often neglects the shared ethical traditions that give meaning to moral concepts. He has advocated for a form of civic education that re-engages students with the moral narratives of their communities, helping them develop a coherent sense of ethical responsibility. Similarly, Sandel (2012) has emphasized the importance of teaching students about their roles within their communities, encouraging them to consider the common good in their moral reasoning. Sandel argues that without such communal grounding, moral and civic education risks becoming superficial and disconnected from the lived experiences of individuals. This is particularly relevant for Lithuania, helping society to develop a moral sense of belonging and a coherent sense of ethical responsibility. Sandel's emphasis on communal roles in moral reasoning further highlights the importance of grounding moral education in

1 For example, see Valstybės pažangos strategija „Lietuvos ateities vizija „Lietuva 2050", https://lrv.lt/media/viesa/saugykla/2023/12/pkvNdKVl0fk.pdf

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the lived experiences of individuals within their communities, which is particularly relevant in Lithuania's tight-knit social structures. However, as it was mentioned already, any real attempts in doing it are rare and marginal (Genys, 2016; Mažeikis, 2009).

Liberals would advocate for moral education that respects individual autonomy. For example, Rawls's (1999) has supported a civic education framework that encourages students to engage with moral principles from a standpoint of fairness and impartiality, ensuring that ethical reasoning respects the rights and freedoms of others. Friedman (2002) has argued for moral education that emphasizes personal responsibility and the ethical dimensions of economic freedom, equipping individuals to make moral choices in both their personal and economic lives. Such a liberal approach to ensure that ethical reasoning respects the rights and freedoms of all citizens, fostering a balanced and fair society, is also very important. However, it is quite typical in the Lithuanian case that personal responsibility is more associated with utilitarian (rather than moral) dimensions of economic freedom (Norkus, 2008).

Digitalization and changing educational priorities. The rise of digital technology presents new challenges and opportunities for civic education. Communitarians would likely express concern that digital disruption could further erode social bonds and deepen individualism. Charles Taylor might argue that civic education needs to adapt by incorporating digital literacy while also reinforcing the importance of face-to-face interactions and community engagement (Taylor, 1989). Sandel (2007) has emphasized that education should not merely focus on technical skills but also on using technology to strengthen communal ties and promote collective well-being. In Lithuania, where digital literacy is increasingly important, civic education could incorporate Taylor's and Sandel's concerns about the potential erosion of social bonds. Education should not only focus on technical skills but also on using digital tools to strengthen communal ties and promote collective well-being, ensuring that technology enhances, rather than detracts from, social cohesion.

In contrast, liberals might view digitalization as an opportunity to expand individual freedoms and access to information. Berlin's pluralism suggests that digital tools should empower individuals to pursue diverse ways of life, free from the imposition of a single communal vision. Rawls would likely emphasize the importance of ensuring that digital tools and platforms are used in ways that are fair and equitable, supporting the development of a just society. Civic education, from a liberal perspective, should focus on equipping students with digital skills while promoting critical thinking and the ability to discern credible information in an increasingly complex digital landscape. In Lithuania, the usage of digital tools to empower individuals to pursue diverse ways of life is very popular, but it is quite rarely linked to the benefit of the public good.

The Development of Liberal and Communitarian Models in Lithuania and its Implications

Citizenship education covers a wide range of aspects aimed at preparing individuals to be informed, responsible, and active members of society (Gutmann, 1999). These include developing an understanding of civic principles, democratic values, social responsibility, and the skills needed to engage in civic life (Mouffe, 1992). Civic education equips individuals with the knowledge, skills, and values needed to participate actively in society and contribute to social change. By educating citizens about their rights, responsibilities, and opportunities for civic participation, civic education strengthens individuals' sense of autonomy and ability to influence the direction of social change (Arthur, 2008).

In a transitional society as Lithuania, civic education is linked with the advancement of democratic values and practices, which are essential for building inclusive and pluralistic societies based on the rule of law, human rights, and social justice (Degėsys et al, 2021;

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Lukšienė, 1992). By developing an understanding of historical contexts, social dynamics, and power structures, civic education enables citizens to play an active role in addressing societal challenges and advocating for positive change during periods of social upheaval (Donskis, 2010). Accordingly, both liberal and communitarian civic education promotes the principles of democratic citizenship, including participation in decision-making processes, but has certain emphasis and quite different practical implications.

Table 2

The Interrelation Between Civic Education Concerns and Its Practical Implications

Transitional stages	Restoration of independence 1988-1992	Transition / Integration into the European Union (2004)	1st war in Ukraine 2014	Global pandemic / 2nd war in Ukraine 2019-2022
Development of civic education policy	1988-Conception of a national school 1992-Conception of Lithuanian Education	General Program for Citizenship 2004	General Program for Citizenship 2008	General Program for Citizenship [currently valid]
Dynamics of citizenship program objectives	To develop citizens and patriots who are aware of their duties and rights, who are able to participate constructively in and improve the governance of society and the state. To foster a sense of love of the Homeland, responsibility for one's own nation and state, national self-esteem, and determination to work for the good of one's native land.	To help pupils develop civic self-awareness through the development of values, knowledge of the structure of society and the state, the basic functions of the state and government, democratic values and principles, and the development of action and participation skills.	To ensure that pupils acquire the knowledge, skills, and attitudes necessary to participate actively and responsibly in the life of the Lithuanian democratic state and civil society	To develop a conscious, independent and active personality, fostering democratic values, able to critically evaluate information and build a progressive Lithuanian civil society.

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Development of liberal model and its implications	The restoration of independence in 1990 marked the beginning of Lithuania's transition from a Soviet-controlled state to a democratic republic. Democratic institutions, free elections and the rule of law were built during this period. Political parties emerged, advocating liberal principles, individual freedoms, human rights, and a free market economy.	Lithuania has implemented wide-ranging economic reforms aimed at shifting from a centrally planned economy to a market economy. Privatization of state-owned enterprises, deregulation, and the promotion of entrepreneurship were key elements of these reforms. Liberal economic policies focused on promoting competition, attracting foreign investment, and stimulating economic growth.	It emphasized the importance of diplomacy and respect for international law, as well as to critically analyze media narratives to understand the complexities of geopolitical tensions. Liberal civic education has encouraged individuals to engage in informed discourse about the geopolitical landscape and the responsibilities of citizenship in a democratic society. The idea of liberal democracy became even more important and stressed in the public discourse.	Lithuania's democratic institutions remained intact during the pandemic because decision-making processes were transparent, constitutional rights were respected, and accountability mechanisms were in place. Similarly, in response to Russia's war in Ukraine, liberal values reinforced Lithuania's commitment to democratic principles, underlining the resilience of its institutions in the face of external threats to sovereignty and democracy.
Development of communitarian model and its implications	After the collapse of the Soviet Union and the restoration of independence, the restoration of the community links that had been broken during the Soviet era was again a major concern. Local communities started to organize civic initiatives, cultural events, and social gatherings aimed at fostering solidarity and strengthening social ties.	Communitarian values encouraged civic engagement and volunteering as people sought to contribute to their communities. A wide range of community organizations, charities and voluntary groups emerged to tackle social problems, support vulnerable groups, and improve local infrastructure. However, communitarian values attracted less attention in public discourse and started to fade away.	It mobilized communities to provide humanitarian aid and support for refugees. By nurturing a sense of solidarity with the people of Ukraine, these initiatives have reinforced the values of compassion, altruism, and civic engagement. Moreover, communitarian civic education has encouraged citizens to reflect on their roles as active members of society, challenging them to contribute positively to their communities and uphold shared values of peace, justice, and solidarity. The communitarian idea did not become popular; thus, it remained underrated in the public discourse.	Communities came together to provide support, assistance, and solidarity to those in need, reflecting the importance of collective action and mutual aid. In Lithuania, during the global pandemic and the Russian war against Ukraine, community played a vital role in promoting community solidarity, cultural resilience, local empowerment, and interpersonal support networks. These values helped to strengthen social cohesion, build resilience, and sustain collective well-being in the face of unprecedented challenges.

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The critique of each model addressing contemporary civic education challenges			
Cultural identity, globalization and economic inequality	Political polarization (disillusionment) and erosion of social cohesion	Moral and ethical education	Digitalization and changing educational priorities
Liberal model			
The liberal approach emphasizes individual freedoms, autonomy, and equal opportunities within a market-driven framework. This model would advocate for ensuring that all citizens, regardless of economic background, have access to civic education that prepares them to compete in a globalized world. However, the liberal model might struggle to fully address economic inequalities, as it often relies on market mechanisms that can exacerbate disparities.	In the face of political polarization, the liberal model might stress the importance of protecting individual rights and encouraging pluralism. It would advocate for civic education that promotes critical thinking, tolerance, and the ability to engage in civil discourse. However, this approach may not fully address the erosion of social cohesion, as it tends to prioritize individual over collective identities.	The liberal perspective would support moral and ethical education to empower individuals to make informed, autonomous decisions. This might translate into a focus on developing personal responsibility and ethical reasoning within a framework that respects individual choice. Liberal reasoning to respect the rights and freedoms of all citizens, fostering a balanced and fair society, is also very important	The liberal approach would likely view digital disruption as an opportunity to enhance individual learning and access to information. This could mean leveraging digital tools to expand civic education and encourage self-directed learning. However, the liberal model might underplay the risks of digital divides and misinformation, focusing more on individual adaptability than on communal resilience.
Communitarian model			
The communitarian perspective focuses on the importance of community bonds and social responsibility. In addressing globalization and economic inequality, this model would prioritize policies and educational programs that strengthen community ties and ensure that civic education promotes social justice and collective well-being. It would emphasize the need to support economically disadvantaged groups to foster a more cohesive society.	The communitarian approach would focus on rebuilding social cohesion by fostering a sense of shared values and communal responsibilities. This model would advocate for civic education that emphasizes the importance of community engagement, mutual respect, and the common good, thereby directly addressing the fragmentation caused by political polarization. However, some risks remain as this model might provoke further division among ideologically different communities.	From a communitarian standpoint, moral and ethical education is central to building a strong community. This would mean a greater focus on teaching shared moral values and fostering a sense of collective responsibility. The communitarian approach would argue that moral education should not only prepare individuals for personal ethical challenges but also for their roles as members of a larger community. The downplay is that both communitarian approach and moral education initiatives are very rare.	The communitarian model would emphasize the need to use digital tools in ways that strengthen community bonds and promote collective learning. This might involve creating digital platforms that foster community engagement and dialogue, while ensuring that civic education addresses the ethical use of technology and the risks associated with digital disruption. This model would also stress the importance of maintaining civic education as a priority within the curriculum, despite pressures to focus more on STEM and workforce readiness.

The communitarian model of civic education emphasizes collective empowerment and agency, fostering a sense of belonging to a community and shared responsibility. In the case of Lithuania, we saw a lack of a sense of community and opportunities for wider impact.

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Thus, this feature of the community model would be very useful as it encourages students to recognize their interconnectedness with others, to cooperate with their fellow citizens, and to pursue common goals for the good of society. Through communitarian civic education in Lithuania, individuals develop a strong sense of civic duty and solidarity, thus contributing to the empowerment of communities and the promotion of the common good.

The communitarian model encourages learners to actively contribute to the well-being of their communities, uphold shared values, and engage in democratic decision-making processes. Through communitarian civic education, individuals in Lithuania develop a sense of belonging to their communities and nation, fostering a deeper commitment to democratic principles and collective action. This is a very important emphasis for Lithuania, encouraging the nurturing of democracy from below, and thus strengthening communal bonds. It is possible to have great respect for democracy, to fight for abstract human rights, but if citizenship is not rooted in a concrete community, it will be harder to feel the power of empathy and to measure the results of action.

The liberal model enshrines a strong commitment to democratic values such as equality, the rule of law, and respect for human rights. Through liberal civic education in Lithuania, individuals learn about the importance of democratic institutions, civic responsibility, and active participation in political life, thereby fostering a culture of democratic citizenship. This is a crucial aspect of the liberal model, fostering respect for democratic culture and broadening the concept of democracy - different communities but equal rights.

The liberal model of civic education is famous for emphasizing personal empowerment and agency, focusing on the rights, freedoms, and autonomy of citizens. In the case of Lithuania, we saw a growing level of public (individual) activism, but a lack of power. Individual citizenship is important, but the impact has very clear limits that depend on community support.

Both liberal and communitarian models of civic education, during the Independence period, have provided valuable benefits in promoting democratic citizenship: fostering critical thinking, active participation, and contributing to state building. Both liberal and communitarian civic education teaches how to critically assess, reflect and transform events in public life from the distant and insignificant to the immediate and significant, re-identifying the role, quality and place of public services and infrastructure (from service delivery to health and social services) in relation to the needs of citizens' daily lives. This encounter between liberal and communitarian civic behavior has very clear consequences for society.

Two different citizenship models are likely to crystallize if continuously develop them separately. In the first (liberal model), democracy emerges as a political system characterized by effective governance, based on 'rationalism' and 'professionalism', with political life being managed as a structured mechanism based on procedural regulation, with civic duties and responsibilities entrusted to 'professional citizens', but with no encouragement for deeper and broader public involvement in community life. In the second case (the communitarian model), democracy is based more on bottom-up civic initiative, autonomy and self-government, values such as mutual trust and responsibility, and political life is likely to be more chaotic as a result, based on community participation, with civic duties and responsibilities being assigned to organized groups of citizens, and with the aim of moderating the straightforward regulation of government by a representative principle.

The criticism of the liberal model relates to nominal participation, where on the one hand, the individual is activated, but their impact remains limited due to a lack of community support. In this case, it is difficult to become a moral leader and to influence others, because leadership is not practically embodied in a given community. Leadership may be shaped by classical values that permeate all members of society (e.g., honor, fair play, etc.), but these are exceptional cases, more typical of certain periods. Conversely, criticism of the communitarian model is associated with overly narrow notions of citizenship that are tailored to the specific

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needs of communities. It is often difficult for community leaders to maintain impartiality and social justice when the range of activities and responsibilities expands.

Ideally, it is advisable to combine these models with each other, considering the unique Lithuanian context and challenges. Starting with a communitarian model that provides the foundations to foster community action, caring for others and a collective sense of responsibility for the well-being of the community. And then introduce a liberal model to promote individual freedom and a sense of individual responsibility, both for one's own community and for other social groups. This would not only facilitate critical thinking and active participation in decision-making processes but also provide a much-needed dimension of civic support and influence. It is important that the process of civic education is flexible and responsive to changing circumstances, and that it encourages public participation and cooperation at different levels.

Discussion

The aim of this study was to examine how liberal and communitarian models of civic education have evolved in Lithuania since the restoration of independence and how these models address contemporary civic challenges such as political polarization, social fragmentation, and digital transformation. Using a comparative historical approach grounded in political sociology, the study analyzed key educational policies, civic participation data, and ideological narratives to assess the strengths and limitations of both models.

The findings confirm that Lithuania's civic education system has experienced a dynamic shift, moving from the communitarian ideals of the National Revival period, focused on collective identity and civic mobilization, toward a more liberal model centered on individual autonomy, rule of law, and pluralism. This mirrors broader patterns observed in other post-communist societies (Apple, 2001; Janoski et al., 2005), where civic education has served as both a vehicle of democratic socialization and a reflection of societal transformation.

The liberal model has contributed to expanding civic literacy, promoting inclusiveness, and aligning with European democratic standards. However, consistent with critiques by Sandel (2012), Taylor (1992), and Walzer (1983), this study finds that liberal civic education in Lithuania often falls short in fostering emotional engagement, ethical responsibility, and long-term civic commitment. Despite the emphasis on rights and participation, civic empowerment indices (e.g., Degutis et al., 2021) suggest that meaningful civic agency and trust in institutions remain limited. This supports Stevenson's (2001) argument that liberal education, while normatively strong, may be too individualistic to cultivate solidarity in fragile civic cultures.

Conversely, the communitarian model – once prominent during the national movement – continues to resonate emotionally and ethically but lacks structural embedding in contemporary educational practice. While community-based learning and moral leadership are increasingly valued, their institutionalization remains weak, particularly in fragmented societies with low interpersonal trust. This is consistent with Howard's (2003) and Foa and Ekiert's (2017) analyses of civil society in Eastern Europe, which highlight the enduring difficulty of sustaining grassroots cohesion without robust intermediary institutions.

The study also highlights the unique role of digitalization in shaping civic identity. While liberal models embrace digital platforms as tools of empowerment (Rawls, 2002), communitarian thinkers caution that digital spaces can dilute affective ties and civic rootedness (Sandel, 2007). In Lithuania, digital participation has grown, but not always in tandem with civic cohesion or critical democratic engagement (Genys, 2023). This pattern underscores the challenge of translating technical access into meaningful civic connectedness.

In addition, moral and emotional dimensions of civic learning – empathy, care, and ethical reasoning – remain underdeveloped. While Lithuanian civic education acknowledges

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values, its formal expression often lacks depth, echoing findings from Gutmann (1999) and Annette (2000), who advocate for stronger normative foundations in civic curricula.

Lithuania offers a particularly insightful case for analyzing civic education due to its multilayered post-Soviet transition and current geopolitical position. The country combines a strong national identity and geopolitical alertness with relatively low civic trust and participation – an unusual configuration that shapes how citizenship is taught and experienced. This study shows how civic education in Lithuania has had to reconcile the emotional legacies of occupation, the liberal demands of European integration, and the rising uncertainties of the digital and geopolitical landscape.

One distinctive finding is the paradoxical coexistence of high symbolic solidarity (especially around national causes) and weak interpersonal or communal trust. While support for causes like Ukraine reveals strong collective sentiment, this does not consistently translate into everyday civic involvement. The legacy of emotional restraint and institutional distrust - rooted in the Soviet past - continues to affect how both teachers and students engage with civic ideas and practices. These patterns underscore that civic education in Lithuania is not merely about conveying democratic knowledge, but about navigating unresolved cultural and emotional legacies.

This context can serve as a comparative model for other transitional democracies where institutional modernization outpaces civic cultural adaptation. Lithuania's experience demonstrates that civic education reform must engage with emotional and symbolic structures, not just technical or legal frameworks. The country's trajectory also highlights the need for educational approaches that address not only knowledge deficits but also affective gaps in civic life.

By bridging liberal and communitarian models, this paper contributes a conceptual and analytical framework that other researchers can apply in settings where civic education must negotiate between historical memory, institutional inertia, and rapidly changing global dynamics. In doing so, it invites scholars and policymakers to think beyond static models and toward integrated, culturally grounded, and emotionally intelligent approaches to civic learning.

While the study provides a robust theoretical synthesis, it does not include empirical fieldwork. As such, the findings reflect conceptual insights rather than measured behavioral patterns. Furthermore, the paper focuses on the Lithuanian context, though it contributes to wider post-Soviet education discourse.

Conclusions and Implications

This study has traced the conceptual and historical development of civic education in Lithuania, highlighting how it has both shaped and been shaped by broader political, social, and cultural transformations. From the early years of national independence to the present, civic education has served as a crucial mechanism for fostering democratic engagement and transmitting citizenship values.

Viewed through the lens of political sociology, civic education is not merely a curriculum matter - it is embedded in wider societal processes. It reflects prevailing ideologies, institutional arrangements, and the strength of civic culture. During the Revival period, civic education in Lithuania emphasized community mobilization and collective responsibility - traits aligned with the communitarian model. Over time, however, civic education has increasingly reflected liberal values, emphasizing individual rights, autonomy, and legal-political literacy.

While both models aim to support democratic resilience, they do so in distinct ways. The liberal model promotes cultural diversity, critical thinking, and tolerance, contributing to inclusion in an increasingly pluralistic society. However, its emphasis on individual responsibility may limit deeper civic cohesion, particularly in societies where civic participation remains

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fragile. Civic engagement in Lithuania has grown, yet civil society's practical influence remains constrained, suggesting that liberal civic education alone may not sufficiently foster democratic participation.

The communitarian model, in contrast, emphasizes shared responsibility, mutual obligation, and local civic ties. Where applied, it can strengthen belonging and promote horizontal trust within and across communities. However, Lithuania's relatively weak communal structures and fragmented public sphere limit the model's broader applicability. As a result, its potential remains largely underutilized in civic education practice.

This analysis demonstrates that neither model is wholly sufficient for addressing Lithuania's current civic challenges. A context-sensitive synthesis - one that draws on the inclusivity of liberalism and the social embeddedness of communitarianism - is needed. Such an approach would align with Lithuania's political development while also nurturing more participatory, trust-based, and emotionally engaged forms of citizenship.

Ultimately, civic education must move beyond abstract models to respond to the lived realities of Lithuanian society. Strengthening communities, bridging social divides, and cultivating civic virtue are not only educational goals but necessary conditions for democratic sustainability. Future civic education efforts should therefore aim not only to inform but also to connect - to foster both competence and care among citizens in an evolving democratic society.

References

Annette, J. (2000). Education for citizenship, civic participation, and experiential and service learning in the community. In D. Lawton, J. Cairns, & R. Gardner (Eds.), *Education for citizenship*. Continuum.

Apple, M. W. (2001). *Educating the "right" way: Markets, standards, God, and inequality*. Routledge/Falmer.

Arthur, J. (2008). *Citizenship studies*. SAGE Publications.

Arthur, J., & Bailey, R. (2000). *Schools and community: The communitarian agenda in education*. Falmer Press.

Balčiūnienė, I. (2007). *Religinio ir pilietinio ugdymo suderinamumas ir papildomumas* [Compatibility and complementarity of religious and civic education] (Doctoral dissertation, Šiaulių universitetas).

Berlin, I. (1969). Two concepts of liberty. In Berlin, I. (Ed.) *Four essays on liberty* (pp. 118–172). Oxford University Press.

Cesiulis, A. (2006). Pilietiškumo sampratos evoliucija ir modernybė [The evolution of the concept of citizenship and modernity]. In Šiliauskas, S. (Ed.), *Pilietinė visuomenė: Politikos įpilietinimo projekcijos: Kolektyvinė monografija* (pp. 106–20). Klaipėdos universitetas.

Czyzewski, K. (2020). *Mažasis pasaulio centras* [The small center of the world]. Versus.

Dahrendorf, R. (1990). *Apmąstymai apie revoliuciją* [Reflections on revolution]. Periodika.

Democracy Index 2020. (2021, February 3). The Economist Intelligence Unit. https://www.eiu.com/public/topical_report.aspx?campaignid=democracy2020

Degėsys, L., Bakanas, P., & Simutytė, Ž. (2021). *Pagrindinio ugdymo socialinis ugdymas. Pilietiškumo pagrindai* [Social education in basic education. Fundamentals of citizenship]. National Agency for Education. https://www.emokykla.lt/upload/EMOKYKLA/BP/PDF/socialinis/N%C5%AŠA_UT_Pilieti%C5%A1kumo%20pagrindai%2003.31%20OK.pdf

Degutis, M., Ramonaitė, A., Žiliukaitė, R., & Petronytė-Urbonavičienė, I. (2021). *Lietuvos visuomenės pilietinės galios indeksas* [Lithuanian civic empowerment index]. Pilietinės visuomenės institutas.

Dryzek, J. S., Honig, B., & Phillips, A. (Eds.). (2008). *The Oxford handbook of political theory*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199548439.001.0001

Donskis, L. (2004). *Pilietinė visuomenė ir jos priešai: Autoritetas, tiesa ir viešoji erdvė XXI amžiaus pradžios Lietuvoje* [Civil society and its enemies: Authority, truth, and public space in Lithuania at the beginning of the 21st century]. Versus aureus.

Donskis, L. (2010). *Pilietinis ugdymas: Bendrojo lavinimo mokyklų 10 klasės vadovėlis* [Civic education: A textbook for grade 10 of secondary education schools]. Versus aureus.

Dunne, J. (2003). Between state and civil society: European contexts for education. In K. McDonough & W. Feinberg (Eds.), *Education and citizenship in liberal-democratic societies*. Oxford University Press. https://doi.org/10.1093/0199253668.003.0005

Foa, R., & Ekiert, G. (2017). The weakness of civil society re-assessed. *European Journal of Political Research, 56*(2), 419–439. https://doi.org/10.1111/1475-6765.12182

Friedman, M. (2002). *Capitalism and freedom: Fortieth anniversary edition*. University of Chicago Press.

Furmonavičius, D. (2009). Sąjūdis's Peaceful Revolution, Part I. *Lituanus* Volume 55, No.1. http://www.old.lituanus.org/2009/09_1_01%20Furmonavicius.htm

Genys, D. (2016). Valstybės viduje: Pilietinės savivokos galimybės ir pilietinio elgesio trajektorijos [Within the state: The possibility of civic consciousness and the trajectories of civic behavior]. *Darbai ir Dienos, 65*, 207–243. https://doi.org/10.7220/2335-8769.65.9

Genys, D. (2023). Digitalization of civic education: Risks and challenges. *Entrepreneurship and Sustainability Issues, 10*(3), 199–213. http://doi.org/10.9770/jesi.2023.10.3(14)

Goodman, J. (1989). Education for critical democracy. *Journal of Education, 171*(2), 88–116. https://doi.org/10.1177/002205748917100207

Gutmann, A. (1999). *Democratic education: With a new preface and epilogue*. Princeton University Press.

Hoffmann, S.-L. (2006). *Civil society 1750-1914*. Palgrave Macmillan.

Howard, M. M. (2003). *The weakness of civil society in post-communist Europe*. Cambridge University Press. https://doi.org/10.1017/CBO9780511840012

Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence*. Cambridge University Press. https://doi.org/10.1017/CBO9780511790881

Janoski, T., Alford, R., Hicks, A., & Schwartz, M. A. (Eds.). (2005). *The handbook of political sociology: States, civil societies and globalization*. Cambridge University Press.

Jokubaitis, A. (2017). *Liberalizmas kaip pilietinė religija* [Liberalism as a civic religion]. Tyto alba.

Kopecký, P., & Mudde, C. (Eds.). (2003). *Uncivil society? Contentious politics in post-communist Europe*. Routledge.

Krastev, I., & Holmes, S. (2019). *The light that failed: A reckoning*. Allen Lane.

Kymlicka, W. (1999). Education for citizenship. In J. M. Halstead & T. McLaughlin (Eds.), *Education in morality*. Routledge.

Kymlicka, W., & Norman, W. (2000). *Citizenship in diverse societies*. Oxford University Press. https://doi.org/10.1093/019829770X.001.0001

Lukšienė, M. (Ed.). (1992). *Lietuvos švietimo koncepcija* [The concept of Lithuanian education]. Publishing Centre.

Lukšienė, M. (2000). *Jungtys* [Connections]. Alma litera.

MacIntyre, A. (1981). *After virtue*. University of Notre Dame Press.

Mažeikis, G. (2004). *Kooperuotų studijų vadovas* [Cooperative studies handbook]. Šiaulių universiteto leidykla.

Mažeikis, G. (2006). Alternatyvus pilietinis ugdymas – moralinei revoliucijai [Alternative civic education for a moral revolution]. *Literatūra ir Menas*, 3102. http://www.culture.lt/lmenas/?leid_id=3102&kas=straipsnis&st_id=9104

Mažeikis, G. (2009). Kairysis komunitarizmas ir alternatyvusis pilietiškumas [Left-wing communitarianism and alternative citizenship]. In A. Bielskis (Ed.), *Demokratija be judėjimo*. Kitos knygos.

Mažeikis, G. (2010). *Propaganda ir simbolinis mąstymas* [Propaganda and symbolic thinking]. Vytauto Didžiojo Universitetas.

Mickūnas, A. (2007). *Demokratija šiandien* [Democracy today]. Versus aureus.

Mikelić Preradovic, N., & Mažeikienė, N. (2019). Service learning in post-communist countries: Lithuania and Croatia. In P. Aramburuzabala, L. McIlrath, & H. Opazo (Eds.), *Embedding service learning in European higher education: Developing a culture of civic engagement* (pp. 180–195). Routledge.

Miseliūnaitė, B., & Vaidelytė, E. (2018). Nepriklausomos Lietuvos aukštojo mokslo politikos raida (1990–2018): Tarp lokalių ir globalių viešosios politikos veiksnių [Higher education policy in independent Lithuania (1990–2018): Between local and global public policy factors]. *Viešoji politika ir administravimas, 17*(3), 439–453. http://dx.doi.org/10.5755/j01.ppaa.17.3.219571

Mouffe, C. (1992). Democratic citizenship and the political community. In C. Mouffe (Ed.), *Dimensions of radical democracy: Pluralism, citizenship, community*. Verso.

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Nash, K. (2010). *Contemporary political sociology: Globalization, politics and power*. Wiley-Blackwell.

Norkus, Z. (2008). *Kokia demokratija, koks kapitalizmas?* [What democracy, what capitalism?]. Vilniaus universiteto leidykla.

Putnam, R. D. (2001). *Kad demokratija veiktų* [Making democracy work]. Margi raštai.

Ramonaitė, A. (2007). *Posovietinės Lietuvos politinė anatomija* [The political anatomy of post-Soviet Lithuania]. Versus Aureus.

Rawls, J. (2002). *Politinis liberalizmas* [translated from: John Rawls, Political Liberalism, (John Devvey essays in philosophy) New York: Columbia University Press, 1993, 1996]. Eurigmas.

Rawls, J. (1999) [1971]. *A theory of justice (Revised ed.)*. Oxford University Press.

Sandel, M. J. (2007). *The case against perfection: Ethics in the age of genetic engineering*. Harvard University Press.

Sandel, M. J. (2012) [1982]. *Liberalism and the limits of justice (2nd ed.)*. Cambridge University Press.

Spurga, S. (2008). Komunistinis įspaudas Vidurio Rytų Europos valstybių pilietinėje visuomenėje [Communist imprint on civil society in Central and Eastern European countries]. *Darbai ir Dienos, 49*, 235–251. https://doi.org/10.7220/2335-8769.49.11

Stevenson, N. (2001). *Culture and citizenship*. Sage Publications. https://doi.org/10.4135/9781446217665

Šaulauskas, M. P. (2000). Socialinė atskirtis ir pilietinė visuomenė [Social exclusion and civil society]. In A. Dobryninas, V. Gaidys, B. Gruževskis, A. Poviliūnas, V. Skapcevičius, M. P. Šaulauskas, & S. Žukas, *Socialiniai pokyčiai: Lietuva, 1990/1998* (pp. 26–33). Garnelis.

Šiliauskas, S. (2005). Pilietinės visuomenės ir pilietiškumo diskursai modernioje demokratijos refleksijoje [Discourses of civil society and citizenship in modern democratic reflection]. *Viešoji politika ir administravimas, 11*, 26–33. https://www.lituanistika.lt/content/3807

Švarplys, A. (2015). Lietuvių nacionalinis naratyvas šiandien: Kultūrinė mobilizacija į globalius iššūkius ar provinciali modernybės baimė? [Lithuanian national narrative today: Cultural mobilization towards global challenges or provincial fear of modernity?]. In *Tautiniai naratyvai ir herojai Vidurio Rytų Europoje po 1989 m.* Vytauto Didžiojo universitetas; Versus Aureus.

Taylor, C. (1996). *Autentiškumo etika* [The ethics of authenticity]. ALK: Aidai.

Taylor, C. (1992). The politics of recognition. In A. Gutmann (Ed.), *Multiculturalism and the politics of recognition* (pp. 25–74). Princeton University Press.

Taylor, C. (1989). *Sources of the self: The making of the modern identity*. Harvard University Press.

Tocqueville, A. (1996). *Apie demokratiją Amerikoje* [Democracy in America]. Vilnius.

Walzer, M. (1998). The civil society argument. In G. Shafir (Ed.), *The citizenship debates: A reader* (pp. 291–308). University of Minnesota Press.

Walzer, M. (1989). *Citizenship*. Cambridge University Press.

Walzer, M. (1983). *Spheres of justice*. Basic Books.

Zaleskienė, I. (2004). *Pilietinio ugdymo socialinė dimensija* [The social dimension of civic education]. Regional Civic Education Centre.

Zaleskienė, I. (2003). Globalizacijos įtaka pilietinei edukacijai [The influence of globalization on civic education]. *Pedagogika, 68*, 56–61. Vilniaus pedagoginis universitetas.

Zaleskienė, I. (1998). *Pilietinio ugdymo sistema: Pilietinio ugdymo standartų ir bendrosios pilietinės visuomenės pagrindų kurso programos komentarai* [The civic education system: Comments on the standards and basic course of civic education]. AB OVO.

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TECHNOLOGY-ENHANCED MATHEMATICAL MODELING IN FLIPPED LEARNING ENVIRONMENTS: CHALLENGES FOR PRE-SERVICE TEACHERS

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Abstract

Due to the sudden closure of the university following a major earthquake, a mathematics education course was rapidly transformed into a fully online, technology-enhanced learning environment, offering a unique opportunity to examine how pre-service middle school mathematics teachers engage with mathematical modeling tasks within a flipped learning framework. Adopting a phenomenological approach, the research involves 51 pre-service middle school mathematics teachers enrolled in a mathematical modeling course in mathematics education. Data were collected through assignments, videos, reports from the Academic Learning Management System, GeoGebra records, and semi-structured interviews. The data obtained from the Academic Learning Management System and GeoGebra were analyzed via descriptive analysis, whereas the semi-structured interviews were examined via content analysis. Pre-service middle school mathematics teachers experienced difficulties in modeling competencies, particularly in applying subject matter knowledge effectively and integrating technology into the modeling process. Technology-enhanced learning environments emerged as a critical support mechanism for fostering the use of content knowledge and promoting mathematical modeling as a problem-solving approach. Structured guidance and the integration of interactive digital tools within flipped learning environments proved to be effective in addressing the challenges encountered during the modeling tasks.
Keywords: *flipped learning, mathematical modeling, online learning, pre-service mathematics teachers*

Introduction

In today's educational landscape, the increasing frequency of unexpected events has accelerated the integration of technological innovations in mathematics education. To preserve educational continuity, educators have been compelled to adopt flexible models and alternative learning environments in university courses (Jummai, 2021; Viju, 2021). Consequently, the functional use of technology in course design has become indispensable (Al-Khasawneh & Obeidallah, 2015; Jung & Lee, 2019; Okai et al., 2014). One prominent response to these changing conditions is the flipped learning model (FLM), which transforms traditional teaching and learning methods (Bergmann & Sams, 2012).

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The FLM enables students to access theoretical content outside class through videos and digital materials, allowing in-class time to focus on interaction, creativity, and discussion (Bergmann & Sams, 2012; Bui & Nguyen, 2023; Truong & Diep, 2023). Its capacity to integrate various technologies enhances its instructional impact (Kozikoğlu, 2019). This approach supports student autonomy, enabling them to learn at their own pace, take responsibility for learning, and develop independent learning skills (Effendi et al., 2024; Fulton, 2012; Yang & Chen, 2020). As a result, engagement and motivation increase (O'Flaherty & Phillips, 2015), fostering more productive learning environments (Strayer, 2012).

This study examines the abrupt transformation of a mathematical modeling course, initially designed with FLM, into an online format due to the earthquake in Türkiye. Such emergencies necessitate swift shifts from traditional models, compelling educators to restructure instruction with flexible and tech-integrated approaches (Effendi et al., 2024). The FLM, in this context, enhances students' individual learning responsibility, supports the integration of in- and out-of-class activities, and proves effective for online learning. Especially in problem-solving-oriented courses such as mathematical modeling, students grasp core concepts outside class and reinforce them through active engagement during sessions, making FLM a viable model in online settings.

Mathematical modeling is critical in helping students make sense of mathematics and relate it to real life (Blum & Leiβ, 2007). Modeling is a powerful teaching tool that allows mathematical concepts to be associated with real-world problems by moving beyond the abstract plane (Wilkins, 2010). In this process, the use of technology, in particular, enables students to develop more complex models, switch between different representations, and gain a deeper understanding of these representations (Siller & Greefrath, 2010). Such course models, where technology is actively used, allow students to access theoretical information offline and use class time for more creative and problem-solving-focused activities.

Despite the increasing emphasis on mathematical modeling in teacher education, little is known about how pre-service middle school mathematics teachers (PSTs) engage with this process in technology-supported, flipped learning environments.

Flipped Learning and Its Use in Mathematics Education

The FLM has gained significant momentum in mathematics education because of its potential to increase student engagement and learning outcomes. This model enhances student engagement, comprehension, and academic performance while also fostering collaboration, autonomy, self-regulation, and positive attitudes toward mathematics (Abeysekera & Dawson, 2015; Fernández-Martín et al., 2020; Kiem & Keodavan, 2024). In addition, technology-enabled course materials help students visualize challenging concepts and make abstract information more understandable (Chen et al., 2014).

While abstract mathematical concepts are often directly conveyed in traditional classroom settings, the FLM encourages active learning, allowing students to engage more deeply with mathematical concepts during face-to-face interactions with teachers and peers (Huesca et al., 2024; Khanova et al., 2015). Priyaadharshini and Sundaram (2018) have emphasized that active participation in learning activities before and during class improves students' critical thinking and problem-solving skills. The model also supports collaborative learning. Through discussion and group work, students reinforce their understanding and retention of mathematical ideas (Leary et al., 2021). Its interactive structure increases motivation (Love et al., 2014), fosters autonomy (Fernández-Martín et al., 2020), enhances learning outcomes (Brown et al., 2022), and promotes critical thinking (Pattimukay et al., 2023) and academic achievement (Sulaimon & Mandittereza, 2024).

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Despite its advantages, the implementation of FLM also presents challenges. Lundin et al. (2018) reported that some students are dissatisfied with the flipped classroom structure, emphasizing that the model requires careful planning and implementation to achieve educational goals effectively. In addition, the success of FLM largely depends on students' self-regulation and motivation, as students must take responsibility for their learning outside of the classroom (Yoon et al., 2020). Therefore, educators must provide adequate support and resources to help students successfully implement this model. High-quality materials and well-structured teacher guidance increase the contribution of this model to student success (Chen et al., 2014).

Overall, FLM emerges as an effective pedagogical approach for deepening conceptual understanding and improving mathematical problem-solving. Within this broader context, it offers significant promise for addressing instructional challenges in complex domains such as mathematical modeling.

Flipped Learning, Technology Integration, and Institutional Support in Mathematical Modeling

The mathematical modeling is a powerful tool that enables the analysis and prediction of complex systems (Wilkins, 2010). It enhances students' critical thinking skills and provides opportunities to relate mathematics to real-world problems (Blum & Niss, 1991). The modeling process involves multiple iterative stages, such as translating a real-life problem into a mathematical model, solving the model, and interpreting the results (Berry & Nyman, 1998; Haines & Crouch, 2007). This cyclical structure supports the development of problem-solving skills and fosters the perception of mathematics as a dynamic and applicable discipline (Borromeo Ferri, 2007).

The integration of technology has significantly enriched the modeling process by enabling visualization, exploration, and validation of models (Galbraith et al., 2007). Digital tools improve students' mathematical thinking and make modeling processes more interactive and effective (Greefrath et al., 2018; Hıdıroğlu, 2015). These tools help students bridge the gap between abstract mathematical concepts and practical applications, allowing them to verify and refine models through iterative processes (Jablonski et al., 2023). Research indicates that the incorporation of computational tools in classrooms deepens mathematical understanding and promotes the development of multiple mathematical connections (Silva et al., 2021).

Despite its advantages, mathematical modeling presents significant challenges for both students and educators. The abstract nature of mathematical concepts often makes it difficult for students to grasp key ideas (Blum & Niss, 1991). Additionally, transforming real-world problems into mathematical models requires a combination of mathematical knowledge, creativity, and critical thinking skills, which can be particularly demanding for learners (Hiebert & Grouws, 2007). Many PSTs may struggle with fully understanding mathematical concepts, which in turn reduces their confidence in teaching mathematical modeling (Blomhøj & Jensen, 2003). Furthermore, a lack of experience in planning and implementing modeling activities poses additional challenges for PSTs, making instructional design more complex (Frejd, 2012; Guerrero-Ortiz & Borromeo Ferri, 2022).

Another significant challenge is students' tendency to rely on familiar mathematical tools, such as continuous functions, even when alternative approaches like discrete modeling might be more suitable (Kaiser et al., 2011). This inclination can result in the superficial use of models and a reluctance to engage with more complex or irregular structures (Edgar, 2008). While some students demonstrate flexibility in adopting varied modeling approaches, many require explicit and structured support to broaden their strategy repertoire (Greefrath et al., 2022).

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Flipped learning (FL) has emerged as an instructional approach that can address some of these challenges by restructuring traditional classroom teaching. By shifting theoretical content delivery to pre-class activities, FL frees up classroom time for active problem-solving, hands-on exploration, and collaborative engagement (Bergmann & Sams, 2012). Within this framework, explanatory videos (EVs) have emerged as crucial tools, providing structured and accessible learning resources that facilitate students' understanding of mathematical concepts (Cevikbas et al., 2025). FL has been shown to enhance student engagement, promote self-regulated learning, and support conceptual understanding, while its integration with mathematical modeling and real-world applications further strengthens students' mathematical reasoning and problem-solving abilities (Fernández-Martín et al., 2020; Kiem & Keodavan, 2024; Lee & Shin, 2022; Özen Ünal et al., 2023). In mathematical modeling, FL provides structured learning experiences where students first engage with theoretical content through online videos and then apply these concepts in in-class technology-supported activities, such as GeoGebra-based modeling tasks (Silva et al., 2021).

Nevertheless, implementing FL effectively involves overcoming several practical and pedagogical challenges. These include difficulties in content creation, technical limitations, and concerns about feasibility (Cevikbas et al., 2023; Zhang, 2023). While technology offers considerable opportunities for enriching mathematical modeling, effective integration depends on strong pedagogical foundations and technological competence. Many PSTs and in-service teachers lack sufficient experience with digital learning environments, resulting in difficulties managing and delivering technology-enhanced instruction. In the absence of proper training and support, these challenges may lead to suboptimal implementation of FL (Lo, 2024).

Additionally, infrastructure limitations present another major barrier to effective FL implementation. Unstable internet access, insufficient digital tools, and inadequate institutional investment in technology can disrupt learning continuity, particularly in regions with lower technological accessibility (Mhlanga et al., 2022; Ndibalema, 2022). The COVID-19 pandemic further underscored these challenges, as educators and students struggled to maintain engagement and access learning materials in remote settings (Izagirre-Olaizola & Morandeira-Arca, 2020).

Institutional support is essential for addressing the challenges associated with FL. Research highlights that successful FL implementation depends on a robust digital infrastructure, comprehensive faculty training, and institutional policies that encourage sustainable technology integration (Polat & Karabatak, 2021). Institutions that invest in learning management systems, high-quality video hosting platforms, and well-structured faculty development programs tend to achieve greater success in adopting FL (Chou et al., 2020; Koh, 2019). Moreover, structured orientation programs for students and ongoing technological support for educators can significantly enhance the effectiveness of FL (Cevikbas & Kaiser, 2022; Yorganci, 2025).

As educational methodologies and digital technologies continue to evolve, FL presents a valuable framework for enhancing mathematical modeling. However, its success hinges on prioritizing institutional investment, educator training, and pedagogically sound technology integration (Yong et al., 2015).

Purpose of the Study

Given both the challenges and opportunities surrounding modeling education, this study aimed to explore how PSTs engage with technology-supported mathematical modeling, particularly within the context of FL. While previous research has examined the role of EVs in modeling education (Cevikbas et al., 2025) and the impact of FL on mathematical thinking (Lee & Shin, 2022; Özen Ünal et al., 2023), limited attention has been paid to how PSTs navigate the integration of FL and mathematical modeling, and how they develop competencies in doing so effectively.

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This study focuses specifically on the concept of functions within mathematical modeling, aiming to identify key difficulties and strategies for enhancing the teaching and learning experience. By addressing these aspects, this study contributes to a deeper understanding of how FL and technology integration can improve mathematical modeling and better prepare PSTs for real-world teaching scenarios.

Accordingly, this study sought to answer the following research question: What challenges do PSTs face while engaging in mathematical modeling tasks within a flipped and technology-enhanced learning environment?

Research Methodology

General Background

In this study, a phenomenology design was adopted. Phenomenology is a research design that reveals the essence of individuals' experiences with a particular phenomenon (Creswell, 2020). A phenomenological research design was employed to explore the difficulties faced by PSTs regarding mathematical modeling in a learning environment they encountered for the first time (Van Manen, 1990).

Participants

The study was conducted with fourth-year students enrolled in the mathematics education program at a state university during the spring semester of the 2022–2023 academic year. The participants consisted of 51 PSTs (36 females and 15 males) whose data were determined via the purposive sampling method (Christensen et al., 2015). Accordingly, volunteer PSTs taking the "Modeling in Mathematics Teaching" course were included in the study. To ensure confidentiality, each participant was assigned a pseudonym (e.g., S1, S2, …, S51) in the reporting of findings.

Data Collection

While the training program for PSTs spanned 12 weeks and provided general insights, this study offers a detailed analysis of the second week. Originally planned as a face-to-face course, the training was transitioned to an online format following the earthquake in Türkiye on February 6, 2023.

In the first week, information was provided about the learning process and organization, and the PSTs' duties and responsibilities in the process were explained. The following cycle was followed in each subsequent week: 1. Video lessons, 2. lesson tasks, 3. Geogebra applications, and 4. Studies were conducted using the Academic Learning Management System (ALMS).

The cycle began with out-of-class instructional videos on mathematical modeling, followed by task submissions through the ALMS platform. During synchronous online sessions, PSTs collaboratively solved mathematical modeling problems using GeoGebra, following the modeling process. Afterward, they worked on project tasks asynchronously and uploaded their work to ALMS. In the final stage, participants reflected on their experiences through peer discussions via WhatsApp, allowing for deeper engagement and insight into the challenges encountered (see Figure 1).

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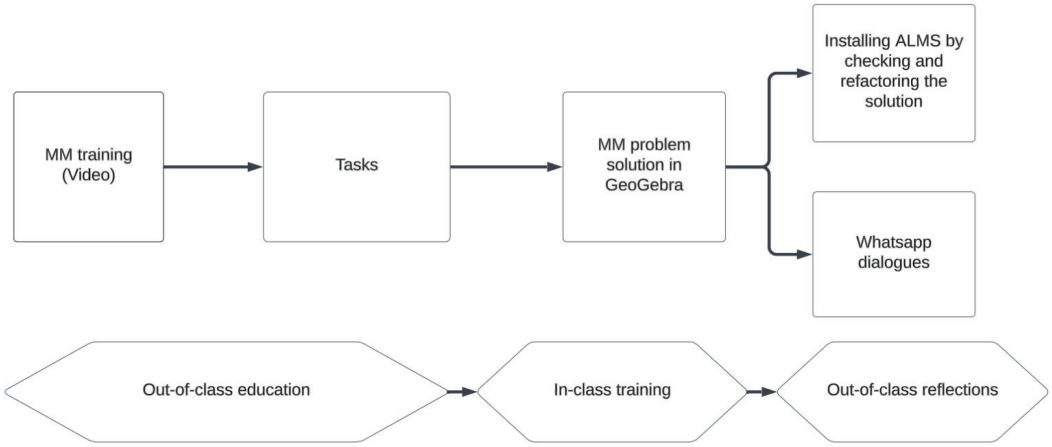
Figure 1
Mathematical Modeling Processes in Online and Flipped Classroom Integration



To create the out-of-class video content of the study, the content of the Modeling in Mathematics Teaching course included in the primary school mathematics teaching program of the Board of Higher Education (2018) was used. In this context, mathematical modeling and problem-solving were the focus, and models and modeling processes in mathematics teaching were examined in detail. In addition, the modeling cycle, model development stages, and principles were conveyed to the PSTs. These videos were prepared in a modular structure, lasted 15-20 minutes, and were made accessible on the ALMS platform.

After watching the course videos, the PSTs were responsible for completing homework consisting of three tasks to reinforce the theoretical knowledge they learned and uploaded it to the system within a day.

Modeling problems were solved via GeoGebra software under the supervision of the academician for two hours every week, and the academician provided support to the students via Zoom and the ALMS platform. During this process, the PSTs had the opportunity to experience the mathematical modeling process in practice through authentic problems structured in GeoGebra.

The mathematical modeling problems were regularly solved using GeoGebra and uploaded to the ALMS system. PSTs were given a 36-hour period to re-evaluate the problems, review the data, and repeat the modeling cycle. During this time, they were encouraged to critically reflect on their solutions and make necessary revisions.

The PSTs shared their solution process and the difficulties they experienced on the WhatsApp platform. During this process, the PSTs, who did not have mathematical modeling experience, shared their ideas and perceptions with other PSTs, contributing to modeling learning and developing a deep understanding of the problem. The discussions allowed PSTs to provide feedback on the process and share their experiences.

Data Collection Tools

In this study, data were collected through assignments uploaded by the PSTs to ALMS, GeoGebra recordings and edited versions of modeling problems, WhatsApp dialogs, and semi-structured interviews reflecting the PSTs' views on the process. The study focused only on the Mushroom Problem:

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> A cultivated mushroom producer measures the average diameter of the mushrooms as 4 mm on the first day and 20 mm on the fourth day. If this producer should pick the mushrooms when their average diameter is 60 mm, on which day should the producer pick the mushrooms?

The design of the mathematical modeling problem in GeoGebra included the following components: (1) an introductory article, (2) preparatory questions (tasks 1–2), (3) the mushroom problem, and (4) tasks and solution tools reflecting the mathematical modeling process (tasks 3–8). For instance, Task 5 asked, "How would you create a model to solve the problem? Explain." PSTs participated in the process of using at least one of their mobile phones, tablets, or computers. They were able to organize their solutions more effectively and upload them to the ALMS system. A total of 51 records related to the mushroom problem were created during this phase.

Data obtained from semi-structured interviews and WhatsApp correspondence were used in the research. Semi-structured interviews were created to understand the participants' views and experiences on certain topics in depth (Patton, 2015), and the questions were prepared in line with the main themes stated in the literature and the difficulties in the mathematical modeling process. WhatsApp correspondence was preferred to reflect the participants' experiences in their natural environments more authentically (Mann & Stewart, 2000).

Data Analysis

The modeling processes of the PSTs were examined through descriptive analysis. Data sources included their GeoGebra activity records and solution uploads on the ALMS platform. The analysis employed a rubric developed by Hıdıroğlu et al. (2014), grounded in the frameworks of Borromeo Ferri (2006) and Berry and Houston (1995).

The modeling process was evaluated across six core competencies: (1) understanding the problem, (2) selecting variables and making assumptions, (3) mathematization, (4) performing the mathematical solution, (5) interpreting solutions, and (6) verifying the model. Each competency was assessed using a three-level scale: no evidence of an approach, partially appropriate approach, and appropriate approach.

To ensure reliability, all data were systematically examined, and differing interpretations were discussed until consensus was achieved. The rubric criteria are presented in Table 1.

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Table 1
Modeling Competency Rubric (Hıdıroğlu et al., 2014)

Competency	No Evidence	Partially Appropriate	Appropriate
C1: Understanding the Problem	Not understanding the Problem	Shows partial understanding with minor errors.	Demonstrates full understanding by identifying given and required elements.
C2: Choosing Variables and Making Assumptions	Fails to identify relevant variables or make assumptions.	Identifies some variables; assumptions are limited or vague.	Fully identifies variables and assumptions
C3: Mathematization	Lacks or misuses mathematical concepts.	Identifies concepts and partially explains their use.	Accurately identifies and applies mathematical concepts.
C4: Implementing the Mathematical Solution	Provides no solution or incorrect procedure.	Partial solution with errors or no conclusion.	Carries out a complete, accurate mathematical solution.
C5: Interpreting Solutions	Draws no or incorrect conclusions.	Interprets results superficially or with limited real-world relevance.	Draws, interprets, and applies conclusions to real life.
C6: Validating the Model	Provides no validation or incorrect validation.	Attempts partial validation with limited evidence.	Effectively tests and justifies the model in varied situations.

The data obtained from the interview forms were analyzed using the deductive content analysis method (Mayring, 2014), as the categories had been predefined based on the theoretical framework and relevant literature. Content analysis, as described by Miles et al. (2014), involves systematically coding and organizing textual data to identify meaningful patterns. In this study, the analysis process began with the coding of interview and correspondence data according to predetermined categories, followed by the grouping of emerging themes under these categories. Finally, thematic interpretation was conducted by examining the relationships among the categories to construct broader themes that reflect the participants' experiences and challenges within the context of mathematical modeling and flipped learning. Themes were determined via an inductive approach in the content analysis process, the data were grouped according to their similarities and common codes were created. Two researchers independently performed the coding, and then consensus and disagreements were evaluated. Disagreements were resolved through discussion, and the reliability of the evaluators was calculated at 95% confidence intervals (Miles & Huberman, 1994). Codes and themes were presented visually with tables and interpreted in the findings section. In addition, statements from PSTs supporting the findings are also included.

Validity and Reliability

To ensure the validity and reliability of this research, credibility, transferability, consistency, and confirmability strategies were employed (Lincoln & Guba, 1985). To enhance the credibility of the study, the research environment, participant profiles, and emerging themes were described in detail, ensuring that the results accurately reflected the real situation (Shenton, 2004)

To ensure transferability, visuals taken from the written solutions of the PSTs were presented directly, and these visuals supported the PSTs' competencies with concrete examples

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(Miles & Huberman, 1994). Consistency was achieved by presenting the findings directly and without interpretation. This approach allows readers to develop interpretations (Patton, 2015). The raw data and coding obtained during the research process were preserved for confirmability. Thus, relevant people can examine the accuracy and transparency of research (Yin, 2018).

Ethical Consideration

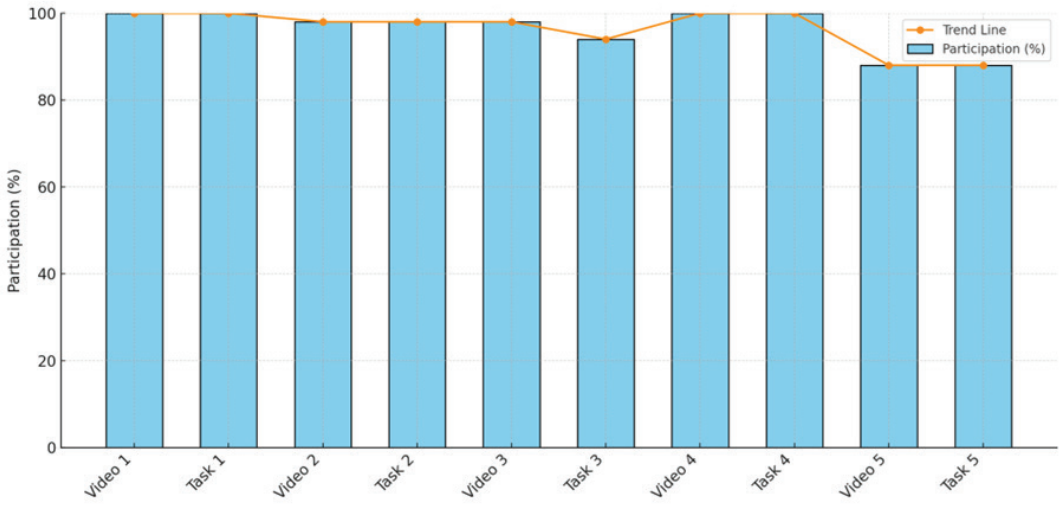
Ethical approval for this study was granted by the Ethics Committee of Van Yuzuncu Yil University (Meeting Date: 23.02.2023, Decision No: 2023/04-13). The instruments used in the research were reviewed and approved for compliance with social and human sciences ethical standards. Participants were informed about the purpose of the study, and informed consent was obtained. Confidentiality and participant well-being were prioritized throughout the study. Furthermore, this study was derived from the master's thesis of the third author, conducted under the supervision of the first author and the co-supervision of the second author.

Research Results

Pre-Classroom Engagement in the FLM

The pre-classroom engagement of PSTs with the video content and tasks uploaded to the ALMS system is presented in Figure 2.

Figure 2
PSTs' Engagement with Video Materials and Tasks



As shown in Figure 2, PSTs demonstrated high levels of participation in pre-classroom activities, suggesting strong engagement with the theoretical foundations of mathematical modeling within the FLM framework. The online FLM supported PSTs' active engagement through flexible access to content and timely feedback. It enabled learning continuity during post-earthquake disruptions and promoted self-regulation and real-world problem-solving via GeoGebra-based tasks. These results suggest that FLM contributed positively to PSTs' conceptual understanding and modeling competencies.

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However, the findings also revealed several challenges. Although ALMS ensured access to instructional materials, infrastructure limitations occasionally impeded participation. Inconsistent academic support and varying levels of student engagement in online discussions were also noted. Furthermore, while digital tools enhanced learning, the abundance of content sometimes made it difficult for PSTs to monitor their progress. These findings underscore the importance of a robust digital infrastructure, equitable mentoring systems, and strategies to enhance active participation and the effective use of feedback in technology-supported learning environments.

PSTs' Mathematical Modeling Competencies in the Mushroom Problem

Table 2 presents PSTs' competencies across the stages of the mushroom modeling task.

Table 2
Participants' Competence in the Mushroom Problem

Competence	None (%)	Partially (%)	Suitable (%)
C1	0	0	100
C2	0	0	100
C3	8	84	8
C4	12	80	8
C5	14	78	8
C6	90	8	2

All participants successfully demonstrated competence in understanding the problem (C1) and defining variables/assumptions (C2). However, a sharp decline was observed in mathematization (C3), solution implementation (C4), and interpretation (C5), with the majority showing only partial competency. Notably, model validation (C6) emerged as the most challenging stage, with 90% of participants unable to demonstrate relevant skills.

These results indicate that while PSTs could initially engage with the problem context, they encountered difficulties transitioning into formal mathematical representations and validating their models. The first critical gap was observed at the mathematization phase. Despite diverse modeling attempts, the study emphasized identifying a crystallized model representative of the overall problem-solving process (see Figure 3).

Figure 3
Main Models Used by Participants in the Mushroom Problem

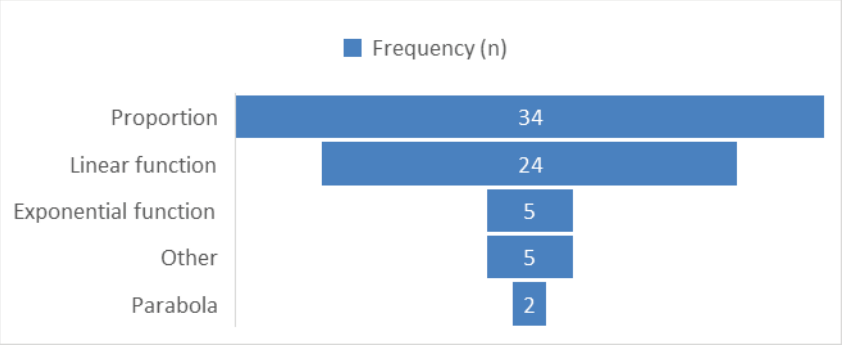

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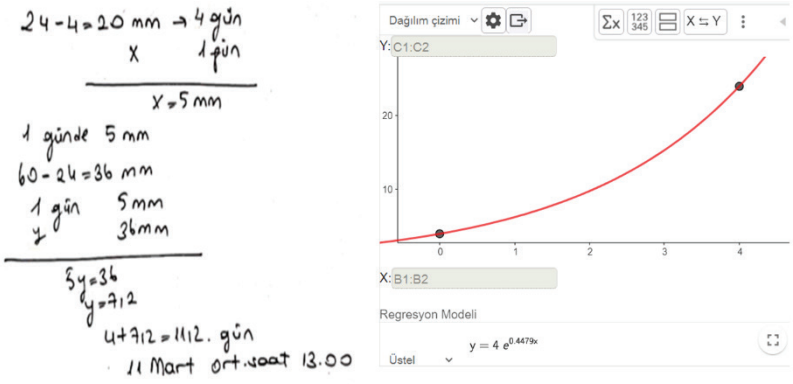
Figure 3 illustrates the mathematical models utilized by PSTs for the mushroom problem. Proportional reasoning, closely associated with slope and the concept of a proportionality constant, emerged as the most frequently adopted model. Within the broader category of function models, the linear function was the dominant choice, whereas only a few participants interpreted the growth pattern as exponential.

Figure 4

Examples of Models in Mathematization Competence



S19's solution S41's solution

Most PSTs, like S19, represented mushroom growth using a proportional model, overlooking the more appropriate exponential nature of the phenomenon. Only four PSTs (S7, S18, S37, S41) demonstrated appropriate modeling within this competency. Notably, S41 correctly employed an exponential model using GeoGebra (rounding the function to) and validated it through a differential equation, exemplifying a high level of modeling competence. However, most participants exhibited only partially appropriate approaches, often implementing flawed models without adequately questioning their validity.

The second critical difficulty emerged in model validation. Many PSTs, despite modeling errors, displayed overconfidence and failed to reflect critically on their solutions. S1 stated, *"I believe the best relationship can be established through a linear function,"* while S6 and S9 expressed confidence in their models based on the given data. This reflects a lack of critical engagement with the modeling process. Although S2 acknowledged data limitations—*"We cannot determine the validity of this relationship in daily life with our limited data"*—no further attempts were made to overcome these constraints. S5 noted: *"In fact, I tried to do it but I could not,"* indicating awareness of alternative models but difficulty in implementation. These findings suggest a need for further development in validation skills, critical thinking, and the integration of technology to enhance model evaluation and refinement.

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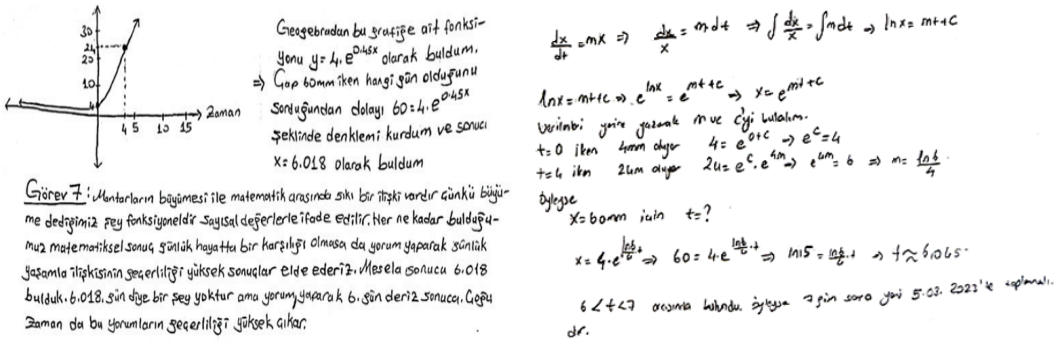
Figure 5
Actions of S7 and S41 During the Model Validation Process


Grafikten bu grafiğe ait fonksiyonu y=4.e^0,45x olarak buldum.
Cop 60mm iken hangi gün olduğunu sorduğundan dolayı 60=4.e^0,45x şeklinde denklemi kurdum ve sonucu x=6.018 olarak buldum
Görev 7: Mantarların büyümesi ile matematik arasında sıkı bir ilişki vardır çünkü büyüme dediğimiz şey fonksiyonel'dir. Sayısal değerlerle ifade edilir. Her ne kadar bulduğumuz matematiksel sonuç günlük hayatta bir karşılığı olmasa da yorum yaparak günlük yaşamla ilişkisinin geçerliliği yüksek sonuçlar elde ederiz. Mesela sonucu 6.018 bulduk. 6.018. gün diye bir şey yoktur ama yorum yaparak 6. gün deriz sonucu. Çoğu zaman da bu yorumların geçerliliği yüksek çıkar.
dx/dt = mx ⇒ dx/x = m.dt ⇒ ∫dx/x = ∫m.dt ⇒ lnx = mt+c
lnx = mt+c ⇒ e^lnx = e^mt+c ⇒ x = e^mt+c
Verilenleri yerine yazarak m ve c'yi bulalım.
t=0 iken 4mm diyor 4 = e^0+c ⇒ e^c = 4
t=4 iken 24mm diyor 24 = e^c.e^4m ⇒ e^4m = 6 ⇒ m = ln6/4
Öyleyse
x=60mm için t=?
x = 4.e^ln6/4.t ⇒ 60 = 4.e^ln6/4.t ⇒ ln15 = ln6/4.t ⇒ t ≈ 6,1065
6 < t < 7 arasında bulundu. öyleyse 7 gün sonra yani 5.03.2023'te toplanmalıdır.

S7's solution and explanation

S41's alternative solution and model validation

In Figure 5, participant S7 realized that the exponential function could be a correct model by saying, "There is a close relationship between mushroom growth and mathematics because what we call growth is functional… For example, we found the result to be 6.018. We can say it is day 6 by commenting…" However, this attempt could not go beyond interpretation. Participant S41 successfully applied the exponential function model, expressed the model graphically, symbolically, and verbally, and reached the same conclusion with the differential equation:

$$\frac{dx}{dt} = mx \Rightarrow \frac{dx}{x} = mdt \Rightarrow \int \frac{dx}{x} = \int mdt \Rightarrow \ln x = mt + c$$
$$\ln x = mt + c \Rightarrow e^{\ln x} = e^{mt+c} \Rightarrow x = e^{mt+c}$$

After determining the constants m and c by substituting the given values, the PSTs obtained an exponential function representing mushroom growth. In this function, $t \approx 6.045$ corresponds to $x = 60$. Since this value lies between 6 and 7, it was concluded that the mushrooms should be collected on the 7th day. This approach illustrates how mathematical models can yield results compatible with real-life contexts when the modeling process is deeply understood. However, other participants failed to demonstrate appropriate strategies during the model verification phase. Despite the use of technology, the results should be supported by field knowledge or cross-verified with alternative technologies.

Conceptual Errors of PSTs in the Modeling Process

Some PSTs, unlike others, misused mathematical objects in the modeling process of the mushroom problem. These errors mainly concerned the concepts of proportion and function. First, S1's error regarding the concept of proportion in solving the mushroom problem is given in Figure 6.

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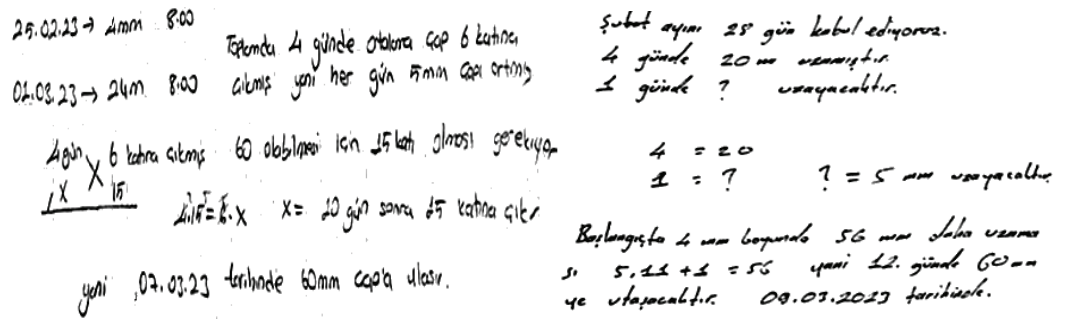
Figure 6
Errors Related to the Concept of Proportion for S1 and S16

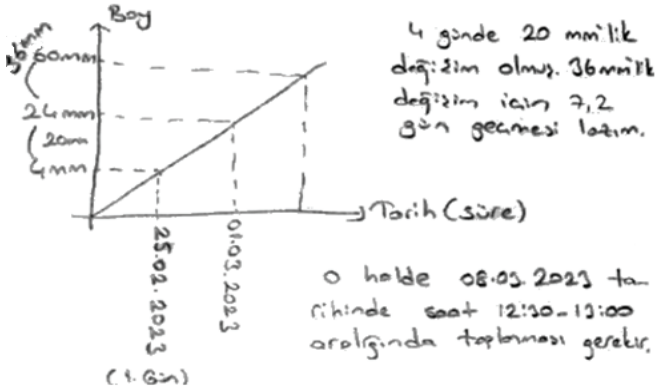

25.02.23 → 4mm 8:00
01.03.23 → 24mm 8:00
Eşitsizlik 4 günde ortalama çap 6 katına çıkmış yani her gün 5mm çap artmış
1 gün X 6 katına çıkmış 60 olabilmesi için 15 kat olması gerekiyor
1 X 15
1/15 = 4/x x= 60 gün sonra 15 katına çıkar
yani 02.03.23 tarihinde 60mm çapa ulaşır.
Şubat ayını 28 gün kabul ediyorsa.
4 günde 20 mm uzamıştır.
1 günde ? uzayacaktır.
4 = 20
1 = ?
? = 5 mm uzayacaktır
Başlangıçta 4 mm boyunda 56 mm daha uzama
5. 11 + 1 = 56 yani 12. günde 60 mm
ye ulaşacaktır 08.03.2023 tarihinde.

S1 approached the mushroom problem using proportionality and outlined her steps in Figure 6. However, Figure 6 reveals an error in her use of mathematical terminology related to direct proportionality. She incorrectly symbolized the problem as "4=20, 1=?"—a misrepresentation of the unitary ratio between time and the mushroom radius. While she verbally articulated the problem ("*If there is a 20 mm extension in 4 days, how much will it be in 1 day*?") correctly, her symbolic expression was flawed. This suggests that S1 struggled to conceptualize and accurately express proportional relationships mathematically.

Similarly, S16 approached the mushroom problem as the mushroom diameter, initially 4 mm on February 25, 2023, increased by 5 mm daily, reaching 24 mm by March 1. However, S16 mistakenly focused on growth multipliers rather than daily increments, saying, "*The average diameter increased 6 times in 4 days, meaning 5 mm daily; it would need to be 15 times to reach 60.*" As shown in Figure 6, S16 correctly applied proportion but created a new unit by misinterpreting variable relationships. These findings indicate that S16 did not fully internalize the conceptual meaning of proportion, highlighting the importance of PSTs developing both procedural and conceptual understanding in mathematics.

Second, Figure 7 presents the errors made by S21 in constructing the linear function graph for the mushroom problem.

Figure 7
S21's Errors in Assuming that the Linear Function Passes through the Origin



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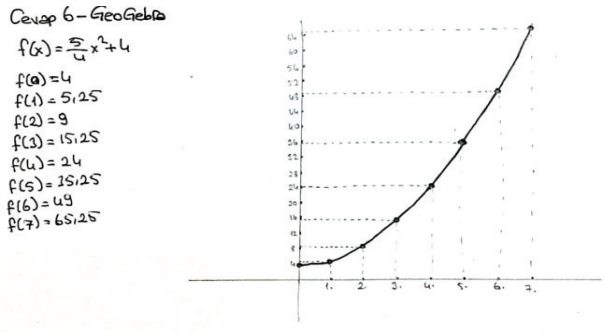
Although the graphs initially appeared correct, they contained significant contextual errors. In the mushroom problem, the diameter increased from 4 mm (25.02.2023) to 24 mm (01.03.2023), and PSTs were asked to estimate when it would reach 60 mm. Many assumed linear growth but misapplied this assumption. A key issue was failing to evaluate whether the graph should pass through the origin. For instance, S21 drew the graph starting at the origin, despite no data prior to 25.02.2023. This led to unitless axes, inaccurate representations, and a lack of technological verification. S21, for example, assumed a 5 mm daily growth but did not validate the intercept, which should have been (0, -1), not the origin.

Figure 8

S5's Quadratic Function Model Error for Mushroom Growth



Finally, S5 used a parabolic model to represent the average radius growth of mushrooms, as shown in Figure 8. The date 25.02.2023 was defined as day 0 in GeoGebra, and the axes were labeled as time (days) and growth (mm). The equation $f(x) = (5/4)x^2 + 4$ was constructed using the points (0,4) and (4,24). However, the exponential nature of mushroom growth—emphasized in many models–was overlooked.

These errors were mainly due to limited conceptual understanding, particularly regarding proportion and function. The findings underscore the importance of both procedural and conceptual knowledge in mathematical modeling.

Reflections from WhatsApp Conversations of PSTs

Primary school mathematics PSTs' WhatsApp discussions provided insights into their experiences and challenges in mathematical modeling.

PSTs displayed varied levels of engagement with mathematical modeling, particularly in distinguishing "mathematical modeling" from "modeling in mathematics". S37 expressed uncertainty: *"Professor Ibrahim [on modeling on YouTube]… clearly separates this in her video, but I was also curious about your opinions."* Similarly, S18 associated mathematical modeling with real-life problems: *"For a situation to be defined as mathematical modeling, there must be a problem that exists in real life."* S26 reflected on encountering real-life applications for the first time, asking, *"Is what we call interpretation meaningful for real life?"* These reflections reveal that while PSTs are familiar with problem-solving, connecting it to real-world applications remains relatively new.

PSTs also expressed confusion about what modeling entails and how to apply theoretical concepts in practice. For example, S37 asked, *"Does using a material or model constitute mathematical modeling, or not? If not, what does mathematical modeling mean?"* S26 admitted that peer discussions only added to her confusion: *"My mind was already confused, friends, and it got even more confused after reading; I would be grateful if you could clarify."*

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S36 highlighted the challenge of differing assumptions: *"When you make solutions based on assumptions here, the results also change… everyone has their own truth."* PSTs questioned the necessity of strict theoretical distinctions, as S37 remarked, *"I do not think it makes much sense to define concepts so theoretically."*

These discussions suggest that while PSTs are actively engaging with mathematical modeling, they struggle to distinguish theoretical ideas from practical applications, highlighting the need for more targeted support in linking theory to real-world contexts.

Challenges Related to the Mathematical Modeling Process Based on PSTs' Views

PSTs reported facing challenges in the modeling process regarding their modeling competencies, subject matter knowledge, and use of technology. PSTs' responses concerning whether they experienced difficulties in each modeling competency are presented in Figure 9.

Figure 9
Challenges in the Modeling Competencies of PSTs

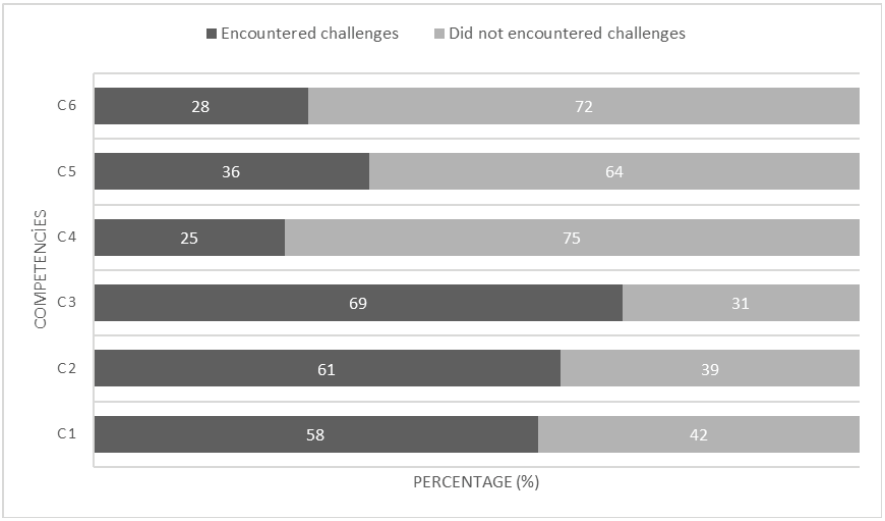

Figure 9 illustrates that PSTs faced challenges at various stages of the mathematical modeling process. Specifically, 58% struggled with understanding the problem, 61% with simplifying it, and 69% with mathematization–the stage where they encountered the most difficulty. In contrast, fewer challenges were reported in mathematical work (25%) and model validation (28%).

Challenges in understanding stemmed largely from unfamiliarity with such problem types. As S23 remarked, *"The reason I struggled was that I hadn't encountered such problems before."* Simplifying the problem was hindered by uncertainty about which data were essential; S17 stated, *"I had trouble because I could not decide whether some data were necessary or not."* The mathematization stage, particularly model creation, proved most demanding: *"Finding the model was the hardest part… it required very creative thinking and good reasoning,"* noted S14.

In the mathematical work stage, concerns arose over the reliability of the model and the risk of calculation errors. S27 shared, *"I was worried about making calculation errors… if my model was not solid, this part became extremely difficult."* Model validation was similarly challenging due to its iterative and time-consuming nature. S16 reflected, *"The validation stage was challenging… revisiting the steps was also difficult. Every time I checked, I felt as if I had*

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made a mistake." Additionally, interpreting results in real-life contexts presented difficulties. As S26 explained*, "Examining the consistency of my results with real life… was the hardest stage."*

These challenges were particularly evident in the initial modeling competencies: understanding the problem, selecting variables, and mathematization. The absence of feedback led PSTs to consider partially correct or incorrect models as accurate. For instance, most PSTs assumed mushroom growth followed a linear or proportional pattern, which influenced subsequent stages of the modeling process. Despite having access to time and resources, they did not adequately verify or validate their solutions. As a result, misconceptions rooted in superficial reasoning remained uncorrected.

This highlights the need for PSTs to develop not only technical modeling skills but also the ability to question and validate their models critically. Errors in early stages negatively impacted later steps, and a lack of evaluative thinking perpetuated inaccurate conclusions. Therefore, providing structured opportunities for validation and reflection is essential for fostering deeper modeling competencies.

PSTs faced notable challenges related to subject matter knowledge, particularly in connecting mathematical concepts, recalling relevant knowledge, and linking mathematics to real-life contexts.

Connecting mathematical concepts was a common difficulty. As S49 noted, *"Even though I knew which mathematical knowledge I needed, I often had a hard time connecting the concepts."* Recalling mathematical knowledge also posed a barrier during problem-solving. S15 stated, *"Sometimes I encountered minor problems due to having forgotten some topics."* Relating mathematics to real life emerged as another significant challenge. S12 admitted, *"I did not know how to translate real-life events into mathematics… I did not have enough knowledge to establish the connection."* Similarly, S37 emphasized the interdependence between problem understanding and concept recall: *"When you do not understand the problem, no mathematical concept comes to mind. When concepts do not come to mind, you cannot form a model or formula."* These findings reveal that gaps in conceptual understanding and application hinder PSTs' ability to effectively engage in modeling tasks.

PSTs encountered challenges related to technology use during the modeling process, primarily due to hardware limitations and insufficient technological proficiency.

Hardware deficiencies impeded modeling efficiency. As S34 stated, *"The difficulty I experienced while solving the problems was related to the inadequacy of my technological equipment,"* highlighting how the lack of essential tools affected their performance. Technological inadequacy was another barrier. S37 noted, *"We received GeoGebra training online, and at that time, I did not have a computer, so I couldn't practice and reinforce the skills,"* indicating that limited access and practice opportunities hindered their ability to use digital tools effectively. These findings suggest that improving both access to technological resources and the development of digital competencies is essential for enhancing the effectiveness of the mathematical modeling process.

Discussion

This study aimed to examine the challenges and learning experiences of PSTs within a technology-supported online learning environment that integrates FL and focuses on mathematical modeling. The findings provide evidence regarding both the potential benefits and the limitations of this instructional model, particularly in fostering problem-solving competencies and enhancing engagement with technology.

The integration of FL and mathematical modeling appears to positively influence PSTs' participation and learning. However, transitioning to a fully online format presents new

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limitations, including decreased interaction and difficulty in accessing learning materials. While PSTs demonstrated high participation levels, many encountered technical problems–especially during real-time activities involving GeoGebra–which negatively impacted their modeling processes. These results resonate with previous research indicating that technological infrastructure issues and disparities in digital literacy levels among both students and teachers hinder the success of online FL environments (Lepkova et al., 2024).

The study also underscores the need for institutional support. Effective implementation of FL requires not only strong digital infrastructure but also teacher training and well-established institutional policies (Polat & Karabatak, 2021). In line with the literature, studies conducted during the pandemic emphasized the importance of structured institutional guidance and professional development programs for effective adoption of the FLM (Chou et al., 2020).

In terms of modeling competencies, the findings revealed a discrepancy between PSTs' self-assessments and their actual performance. While participants perceived themselves to be successful in the mathematical modeling process, objective data indicated underperformance in critical stages such as model creation and validation. This mismatch may be attributed to limited feedback mechanisms, which hinder PSTs' ability to recognize their errors and contribute to an overestimation of their skills. These observations align with previous studies reporting significant difficulties during the mathematization and validation phases of modeling (Anhalt et al., 2021; Guerrero-Ortiz & Borromeo Ferri, 2022; Şahin et al., 2023) and emphasize the importance of structured support systems in helping PSTs develop modeling competencies (Asempapa & Sturgill, 2019; Hıdıroğlu et al., 2014). Furthermore, Viseu et al. (2020) reported that PSTs struggle with identifying appropriate proportional constants, evaluating the plausibility of model-generated results, and designing graphs based on experimental data. Similarly, our study revealed that PSTs often use linear functions or parabolas instead of exponential functions, suggesting the need for stronger support in the development of accurate mathematical representations.

Another challenge identified was the integration of technology in the modeling process. While some PSTs used digital tools such as GeoGebra effectively for analyzing models, others encountered barriers such as hardware limitations, lack of software proficiency, and technological infrastructure issues. These findings are consistent with prior studies showing that although technology has the potential to enhance mathematical modeling processes, it can also be a source of difficulty for individuals unfamiliar with it (Altuntaş et al., 2024; Hıdıroğlu et al., 2018). Nevertheless, it was observed that PSTs were able to quickly test and evaluate different model types using software tools, even with limited data. This demonstrates that effective use of technology can strengthen modeling skills, particularly when supported by targeted training on tools like MATLAB and GeoGebra (Cevikbas et al., 2022).

The study also revealed that the success of FL depends heavily on institutional backing. Although FL promotes flexibility, active learning, and student responsibility (Johnston, 2017; Lepkova et al., 2024), its effectiveness is often limited by inadequate support structures and digital inequalities (Cevikbas et al., 2025). While student engagement is encouraged, it should go beyond verbal participation to include active involvement in decision-making, peer discussions, and technological engagement in modeling activities. Guerrero et al. (2015) noted that FL enhances student-centered interactions, but its effectiveness over traditional methods depends significantly on how the model is implemented. As Lo (2024) and Johnston (2017) emphasized, student feedback–informed adaptations, such as revising video content or adding supplementary tutorials, can improve engagement. However, in the absence of comprehensive institutional policies and resources, such adaptations may not be sustainable.

A further finding relates to the conceptual understanding of PSTs. Many participants demonstrated difficulties in connecting mathematical concepts or recalling relevant knowledge when needed, especially in the context of real-life problems. This deficiency often led to

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inaccurate or inappropriate modeling decisions and limited their ability to interpret real-world phenomena mathematically. These challenges are linked to insufficient subject-matter knowledge and a shallow understanding of fundamental mathematical concepts, which are critical for constructing and validating models (Aruna et al., 2022; Erbas et al., 2014; Zulkarnaen, 2018).

Moreover, PSTs often exhibited a tendency to prioritize obtaining final answers over engaging with the modeling process itself. Combined with limited experience and time constraints, this focus hampered the development of robust modeling strategies (Sen Zeytun et al., 2023). Yong et al. (2015) highlighted that interactive learning environments have the potential to strengthen students' conceptual understanding; however, this potential may remain limited in the absence of in-class interaction.

Cognitive errors, such as using irrelevant procedures or having incomplete schemas, highlight fundamental misunderstandings of mathematical concepts (Zulkarnaen, 2018). These errors often stem from deficiencies in algebra, geometry, and trigonometry, which are essential for constructing and interpreting models. Many studies emphasize the need for PSTs to develop a deeper understanding of these areas (Ikeda et al., 2025; Sen Zeytun et al., 2023).

Despite these challenges, the study underscores the potential for PSTs to enhance their modeling abilities through targeted educational interventions. Structured professional development opportunities, workshops, and coursework focused on the practical application of mathematical knowledge can support PSTs in bridging the gap between theoretical understanding and real-world problem-solving (Şahin et al., 2023). Furthermore, leveraging technology and recognizing individual cognitive differences may further support PSTs in developing effective modeling and reasoning skills (Gonzales & Arnal-Bailera, 2020).

Conclusions and Implications

This study demonstrates that a technology-supported online mathematical modeling environment, integrated with the FL model, holds considerable potential for enhancing PSTs' modeling competencies. Nevertheless, its effectiveness is limited by structural challenges such as reduced interaction in online settings, difficulties in accessing learning materials, and technical shortcomings.

The effectiveness of the FL model was found to be closely associated with institutional infrastructure, teacher training, and the availability of digital equipment. Variations in PSTs' levels of technological literacy and disparities in access to digital tools hindered the integration of technology into the modeling processes.

A notable discrepancy emerged between PSTs' self-perceptions and their actual performance in modeling tasks. Specifically, deficiencies were evident during model construction and validation phases. Moreover, PSTs often struggled to connect fundamental mathematical concepts to real-world contexts, showing a tendency to prioritize outcomes over processes. This process-oriented gap hindered the development of effective modeling strategies and limited their ability to interpret real-life situations mathematically.

While integrating FL into mathematical modeling tasks fosters engagement and problem-solving, challenges related to self-regulation and digital fluency must be addressed to fully leverage its potential. It is important to acknowledge that the study's scope—limited to a specific cohort of PSTs—may affect the generalizability of the findings. Furthermore, individual cognitive differences and contextual influences were not directly examined.

Future research should consider longitudinal designs to better capture the progression of PSTs' modeling skills. Comparative investigations exploring diverse instructional designs within FL environments may also offer valuable insights for optimizing teacher education practices.

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Ethical Approval

This study was approved by the Van Yüzüncü Yıl University Ethics Committee for Human Research with protocol number 2023/04-13 and decision number 13/26, dated 23.02.2023.

Declaration of Interest

The authors declare no competing interest.

References

Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale, and a call for research. *Higher Education Research & Development*, *34*(1), 1–14. https://doi.org/10.1080/07294360.2014.934336

Al-Khasawneh, A., & Obeidallah, R. (2015). Factors contributing to e-learning success. *International Journal of Information and Communication Technology Education*, *11*(3), 30–38. https://doi.org/10.4018/IJICTE.2015070103

Altuntaş, M., Ay, Z. S., & Çetin, I. (2024). Mathematical modeling in online learning environments: Student challenges. *Bolu Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, *24*(2), 1049–1075. https://doi.org/10.17240/aibuefd.2024..-1407578

Anhalt, C. O., Cortez, R., & Aguirre, J. M. (2021). Mathematical modeling thinking: A construct for developing mathematical modeling proficiency. In J. M. Suh, M. H. Wickstrom, & L. D. English (Eds.), *Exploring mathematical modeling with young learners* (pp. 45–66). Springer. https://doi.org/10.1007/978-3-030-63900-6_3

Aruna, A., Alma, B., Nurbapa, M., Doolotbai, B., & Akmaral, R. (2022). Technology of formation of students' skills of educational and cognitive activity through mathematical modelling. *World Journal on Educational Technology: Current Issues*, *14*(6), 1685–1697. https://orcid.org/0000-0002-5893-6712

Asempapa, R. S. & Sturgill, D. J. (2019). Mathematical modeling: Issues and challenges in mathematics education and teaching. *Journal of Mathematics Research, 11*(5), 71–78. https://doi.org/10.5539/jmr.v11n5p71

Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education.

Berry, J., & Houston, K. (1995). *Mathematical modelling*. Gulf Professional Publishing.

Berry, J., & Nyman, M. A. (1998). Introducing mathematical modelling skills to students and the use of posters in assessment. *Problems, Resources, and Issues in Mathematics Undergraduate Studies*, *8*(2), 103-–115. https://doi.org/10.1080/10511979808965888

Blomhøj, M., & Jensen, T. H. (2003). Developing mathematical modelling competence: Conceptual clarification and educational planning. *Teaching Mathematics and its Applications, 22*(3), 123–139. https://doi.org/10.1093/teamat/22.3.123

Blum, W., & Leiβ, D. (2007). How do students and teachers deal with mathematical modelling problems? The example sugarloaf and the DISUM project. In C. Haines, P. L. Galbraith, W. Blum, & S. Khan (Eds.), *Mathematical modelling (ICTMA 12): Education, engineering and economics* (pp. 222–231). Horwood.

Blum, W., & Niss, M. (1991). Applied mathematical problem solving, modeling, applications, and links to other subjects: State, trends and issues in mathematics instruction. *Educational Studies in Mathematics*, *22*(1), 37–68.

Borromeo Ferri, R. (2006). Theoretical and empirical differentiations of phases in the modelling process. *ZDM, 38*(2), 86-95.

Borromeo Ferri, R. (2007). *Modelling problems from a cognitive perspective*. In C. Haines, P. Galbraith, W. Blum & S. Khan (Ed.), *Mathematical modelling* (ICTMA-12): Education, engineering and economics (pp. 260–270). Horwood.

Brown, B., Delanoy, N., & Webster, M. (2022, May 18). Flipped learning in grade 7 and 9 mathematics. *Open Technology in Education, Society, and Scholarship Association Conference Proceedings, 2*(1), 1–8. https://doi.org/10.18357/otessac.2022.2.1.23

Bui, T. T., & Nguyen, T. S. (2023). The survey of digital transformation in education: A systematic review. *International Journal of TESOL & Education, 3*(4), 32–51. https://doi.org/10.54855/ijte.23343

Cevikbas, M., & Kaiser, G. (2022). Promoting personalized learning in flipped classrooms: A systematic review study. *Sustainability*, *14*(18), 11393. https://doi.org/10.3390/su141811393

Cevikbas, M., Greefrath, G., & Siller, H. S. (2023). Advantages and challenges of using digital technologies in mathematical modelling education–a descriptive systematic literature review. *Frontiers in Education, 8*, 1142556. https://doi.org/10.3389/feduc.2023.1142556

Cevikbas, M., Kaiser, G., & Schukajlow, S. (2022). A systematic literature review of the current discussion on mathematical modelling competencies: State-of-the-art developments in conceptualizing, measuring, and fostering. *Educational Studies in Mathematics*, *109*(2), 205-236. https://doi.org/10.1007/s10649-021-10104-6

Cevikbas, M., Mießeler, D., & Kaiser, G. (2025). Pre-service mathematics teachers' experiences and insights into the benefits and challenges of using explanatory videos in flipped modelling education. *ZDM–Mathematics Education*, 1–14. https://doi.org/10.1007/s11858-025-01650-x

Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education, 79*, 16–27. https://doi.org/10.1016/j.compedu.2014.07.004

Chou, C. L., Hung, M. L., Tsai, C. W., & Chang, Y. C. (2020). Developing and validating a scale for measuring teachers' readiness for flipped classrooms in junior high schools. *British Journal of Educational Technology*, *51*(4), 1420–1435. https://doi.org/10.1111/bjet.12895

Christensen, L. B., Johnson, R. B., & Turner, L. A. (2015). *Araştırma Yöntemleri Desen ve Analiz* [*Research Methods Design and Analysis*]. (A. Aypay, Ed.). Anı Publishing.

Creswell, J. W. (2020). *Nitel araştırma yöntemleri: Beş yaklaşıma göre nitel araştırma ve araştırma deseni* [Qualitative research methods: Qualitative research and research design according to five approaches]. (M. Bütün & S. B. Demir, Eds.). Siyasal Kitabevi.

Edgar, G. A. (2008). *Measure, topology, and fractal geometry* (2nd ed.). Springer.

Effendi, A. D., Aziz, N. A. A., Low, H. L., & Sia, C. W. (2024). The role of intelligent system in transforming flipped classroom for online learning. In *Intelligent systems modeling and simulation III: Artificial intelligent, machine learning, intelligent functions and cyber security* (pp. 289–332). Springer. https://doi.org/10.1007/978-3-031-67317-7_19

Erbas, A. K., Kertil, M., Çetinkaya, B., Cakiroglu, E., Alacaci, C., & Bas, S. (2014). Mathematical modeling in mathematics education: Basic concepts and approaches. *Educational Sciences: Theory and Practice*, *14*(4), 1621–1627.

Fernández-Martín, F. D., Romero-Rodríguez, J. M., Gómez-García, G., & Navas-Parejo, M. R. (2020). Impact of the flipped classroom method in the mathematical area: A systematic review. *Mathematics*, *8*(12), 2162. https://doi.org/10.3390/math8122162

Frejd, P. (2012). Teachers' conceptions of mathematical modelling at Swedish Upper Secondary school. *Journal of Mathematical Modelling and Application, 1*(5), 17–40.

Fulton, K. (2012). 10 reasons to flip. *Phi Delta Kappan, 94*(2), 20–24. https://doi.org/10.1177/003172171209400205

Galbraith, P., Stillman, G., Brown, J., & Edwards, I. (2007). Facilitating middle secondary modelling competencies. In *Mathematical modelling* (pp. 130–140). Woodhead Publishing.

Gonzales, A., & Arnal-Bailera, A. (2020). Prospective teachers difficulties in integrating technology into problem solving and teaching on rational numbers. *Acta Scientae*, 50–63. https://doi.org/10.17648/acta.scientiae.6237

Greefrath, G., Hertleif, C., & Siller, H. S. (2018). Mathematical modelling with digital tools–A quantitative study on mathematising with dynamic geometry software. *ZDM – Mathematics Education, 50*(1), 233–244. https://doi.org/10.1007/s11858-018-0924-6

Greefrath, G., Siller, H. S., Vorhölter, K., & Kaiser, G. (2022). Mathematical modelling and discrete mathematics: opportunities for modern mathematics teaching. *ZDM–Mathematics Education*, *54*(4), 865-879. https://doi.org/10.1007/s11858-022-01339-5

Guerrero, S., Beal, M., Lamb, C., Sonderegger, D., & Baumgartel, D. (2015). Flipping undergraduate finite mathematics: Findings and implications. *Primus*, *25*(9-10), 814–832. https://doi.org/10.1080/10511970.2015.1046003

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Guerrero-Ortiz, C., & Borromeo Ferri, R. (2022). Pre-service teachers' challenges in implementing mathematical modelling: Insights into reality. *PNA. Revista de Investigación en Didáctica de la Matemática, 16*(4), 309–341. https://doi.org/10.30827/pna.v16i4.21329

Haines, C., & Crouch, R. (2007). Mathematical modelling and applications: Ability and competence frameworks. In W. Blum, P. L. Galbraith, H.-W. Henn & M. Niss (Eds.), *Modelling and applications in mathematics education: The 14th ICMI study* (pp. 417–424). Springer.

Hıdıroğlu, Ç. N. (2015). *Teknoloji destekli ortamda matematiksel modelleme problemlerinin* çözüm *süreçlerinin analizi: Bilişsel ve* üstbilişsel *yapılar* üzerine *bir açıklama* [*Analysis of the solution processes of mathematical modeling problems in technology-supported environment: An explanation on cognitive and metacognitive structures*]. Doktora tezi [PhD thesis]. Dokuz Eylül Üniversitesi, Eğitim Bilimleri Enstitüsü, İzmir [Dokuz Eylul University, Institute of Educational Sciences, Izmir].

Hıdıroğlu, Ç. N., Özaltun, Çelik, A., Kula, Ünver, Z. & Bukova, Güzel, E. (2018). Matematik öğretmeni adaylarının teknoloji destekli matematiksel modelleme sürecindeki eylemleri: Uzaklık problemi [Prospective mathematics teachers' actions in technology-aided mathematical modeling process: distance problem]. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 20*(3), 782–809.

Hıdıroğlu, Ç. N., Tekin Dede, A., Kula, S., & Bukova Güzel, E. (2014). Öğrencilerin kuyruklu yıldız problemi'ne ilişkin çözüm yaklaşımlarının matematiksel modelleme süreci çerçevesinde incelenmesi [Examining students' solution approaches to the comet problem within the framework of the mathematical modeling process.]. *Mehmet Akif Ersoy* Üniversitesi *Eğitim Fakültesi Dergisi* [*Mehmet Akif Ersoy University Faculty of Education Journal*]*, 31*, 1–17.

Hiebert, J., & Grouws, D. A. (2007). The effects of classroom mathematics teaching on students' learning. In F. K. Lester Jr (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 371–404). IAP.

Huesca, G., Martínez-Treviño, Y., Molina-Espinosa, J. M., Sanromán-Calleros, A. R., Martínez-Román, R., Cendejas-Castro, E. A., Bustos, R. (2024). Effectiveness of using ChatGPT as a tool to strengthen benefits of the flipped learning strategy. *Education Sciences, 14*, Article660. https://doi.org/10.3390/educsci14060660

Ikeda, T., Borromeo Ferri, R., & Kawakami, T. (2025). Factors influencing Japanese pre-service teachers' self-efficacy in teaching mathematical modelling. *ZDM–Mathematics Education*, 1–14. https://doi.org/10.1007/s11858-025-01666-3

Izagirre-Olaizola, J., & Morandeira-Arca, J. (2020). Business management teaching-learning processes in times of pandemic: Flipped classroom at a distance. *Sustainability*, *12*(23), 10137. https://doi.org/10.3390/su122310137

Jablonski, S., Barlovits, S., & Ludwig, M. (2023). How digital tools support the validation of outdoor modelling results. *Frontiers in Education, 8*, 15.1145588 https://doi.org/10.3389/feduc.2023.1145588

Johnston, B. M. (2017). Implementing a flipped classroom approach in a university numerical methods mathematics course. *International Journal of Mathematical Education in Science and Technology*, *48*(4), 485–498. https://doi.org/10.1080/0020739X.2016.1259516

Jummai, B. (2021). The need for digital transformation in the education sector in Nigeria. *Current Journal of Applied Science and Technology,* 41–47. https://doi.org/10.9734/cjast/2021/v40i4731636

Jung, I. & Lee, J. (2019). A cross-cultural approach to the adoption of open educational resources in higher education. *British Journal of Educational Technology, 51*(1), 263–280. https://doi.org/10.1111/bjet.12820

Kaiser, G., Schwarz, B., & Buchholtz, N. (2011). Authentic modelling problems in mathematics education. In G. Kaiser, W. Blum, R. Borromeo Ferri, & G. Stillman (Eds.), *Trends in teaching and learning of mathematical modelling* (Vol. 1, pp. 591–601). Springer. https://doi.org/10.1007/978-94-007-0910-2_57

Khanova, J., Roth, M. T., Rodgers, J. E., & McLaughlin, J. E. (2015). Student experiences across multiple flipped courses in a single curriculum. *Medical education*, *49*(10), 1038–1048. https://doi.org/10.1111/medu.12807

Kiem, M. T., & Keodavan, X. (2024). Unpacking the advantages and challenges of flipped classrooms in initial mathematics teacher education in Vietnam. *Eurasia Journal of Mathematics, Science and Technology Education*, *20*(5), em2437. https://doi.org/10.29333/ejmste/14449

Koh, J. H. L. (2019). Four pedagogical dimensions for understanding flipped classroom practices in higher education: A systematic review. *Educational Sciences: Theory and Practice*, *19*(4), 14–33. https://doi.org/10.12738/estp.2019.4.002

Kozikoğlu, İ. (2019). Analysis of the studies concerning flipped learning model: a comparative meta-synthesis study. *International Journal of Instruction, 12*(1), 851–868. https://doi.org/10.29333/iji.2019.12155a

Leary, M., Tylka, A., Corsi, V., & Bryner, R. (2021). The effect of first-year seminar classroom design on social integration and retention of STEM first-time, full-time college freshmen. *Education Research International, 2021*, 4262905. https://doi.org/10.1155/2021/426290

Lee, J., & Shin, D. (2022). Effects of a flipped classroom using Khan Academy and mathematical modeling on overcoming difficulties in learning mathematics. *Research in Mathematical Education*, *25*(2), 99–115. https://doi.org/10.7468/JKSMED.2022.25.2.99

Lepkova, N., Gülseçen, S., & Talan, T. (2024). Flipped classroom method application case study analysis. *Baltic Journal of Modern Computing, 12*(2), 150–164. https://doi.org/10.22364/bjmc.2024.12.2.02

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Lo, C. K. (2024). Strategies for enhancing online flipped learning: A systematic review of empirical studies during the COVID-19 pandemic. *Interactive Learning Environments*, *32*(7), 3517–3545. https://doi.org/10.1080/10494820.2023.2184392

Love, B., Hodge, A., Grandgenett, N., & Swift, A. W. (2014). Student learning and perceptions in a flipped linear algebra course. *International Journal of Mathematical Education in Science and Technology*, 45(3), 317–324. http://dx.doi.org/10.1080/0020739X.2013.822582

Lundin, M., Bergviken Rensfeldt, A., Hillman, T., Lantz-Andersson, A., & Peterson, L. (2018). Higher education dominance and siloed knowledge: A systematic review of flipped classroom research. *International Journal of Educational Technology in Higher Education, 15*(1), 20. https://doi.org/10.1186/s41239-018-0101-6

Mann, C., & Stewart, F. (2000). *Internet communication and qualitative research: A handbook for researching online*. Sage Publications.

Mayring, P. (2014). *Qualitative content analysis theoretical foundation, basic procedures and software solution*. Beltz.

Mhlanga, D., Denhere, V., & Moloi, T. (2022). COVID-19 and the key digital transformation lessons for higher education institutions in South Africa. *Education sciences*, *12*(7), 464. https://doi.org/10.3390/educsci12070464

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications.

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage Publications.

Ndibalema, P. (2022). Constraints of transition to online distance learning in Higher Education Institutions during COVID-19 in developing countries: A systematic review. *E-learning and Digital Media*, *19*(6), 595–618. https://doi.org/10.1177/20427530221107510

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The internet and higher education*, *25*, 85–95. https://doi.org/10.1016/j.iheduc.2015.02.002

Okai, S., Uddin, M., Arshad, A., Alsaqour, R., & Shah, A. (2014). Cloud computing adoption model for universities to increase ict proficiency. *Sage Open, 4*(3), Article 215824401454646. https://doi.org/10.1177/2158244014546461

Özen Ünal, D., Yazıcı, E., & Arabacıoglu, T. (2023). Implications from a modelling based flipped mathematics course. *International E-Journal of Educational Studies, 7*(15), 465–483. https://doi.org/10.31458/iejes.1286927

Pattimukay, N., Takaria, J., & Ishabu, L. (2023). The effect of the flipped classroom model on the mathematical critical thinking ability of elementary school students. *Jurnal Pendidikan Matematika (JUPITEK)*, *6*(1), 49–54. https://doi.org/10.30598/jupitekvol6iss1pp49-54

Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Sage Publications.

Polat, H., & Karabatak, S. (2022). Effect of flipped classroom model on academic achievement, academic satisfaction and general belongingness. *Learning Environments Research*, *25*(1), 159–182. https://doi.org/10.1007/s10984-021-09355-0

Priyaadharshini, M., & Sundaram, B. V. (2018). Evaluation of higher-order thinking skills using learning style in an undergraduate engineering in flipped classroom. *Computer Applications in Engineering Education, 26*(6), 2237–2254. https://doi.org/10.1002/cae.22035

Sen Zeytun, A., Cetinkaya, B., & Erbas, A. K. (2023). Why do prospective teachers have difficulties in mathematical modelling? Insights from their perspectives. *International Journal of Mathematical Education in Science and Technology*, 1–24. https://doi.org/10.1080/0020739X.2023.2171922

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75.

Siller, H. S., & Greefrath, G. (2010). Mathematical modelling in class regarding to technology. In V. Durand-Guerrier, S. Soury-Lavergne & F. Arzarello (Eds.), *Proceedings of the sixth congress of the European Society for Research in Mathematics Education* (pp. 2136–2145). INRP.

Silva, R., Martins, F., Costa, C., Cravino, J., & Lopes, J. B. (2021). Learning Scenario to Promote Comprehension of the Meaning of Subtraction. *Education Sciences*, *11*(12), 757. https://doi.org/10.3390/educsci11120757

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*(2), 171–193. https://doi.org/10.1007/s10984-012-9108-4

Sulaimon, J. T., & Manditereza, B. (2024). Investigating the effect of the traditional flipped classroom in teaching primary 3 class mathematics. *Journal of Education and Practice*, *8*(1), 1–12. https://orcid.org/0000-0003-2564-5860

Şahin, S., Gürbüz., R. & Dogan, M. F. (2023). Investigating mathematical modeling problem designing process of inservice mathematics teachers. *Cukurova University Faculty of Education Journal, 52*(1), 33–70. https://doi.org/10.14812/cuefd.1033080

Truong, T., & Diep, Q. (2023). Technological spotlights of digital transformation in tertiary education. *IEEE Access, 11*, 40954–40966. https://doi.org/10.1109/access.2023.3270340

Van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. The University of Western Ontario.

Viju, G. K. (2021). Online and distance learning In Sudanese Universities: A necessity in the light of the Covid-19 pandemic. *International Journal of Engineering Applied Sciences and Technology*, *5*(10), 11–19.

Viseu, F., Martins, P.M., & Leite, L. (2020). Prospective Primary School Teachers' Activities when Dealing with Mathematics Modelling Tasks. *Journal on Mathematics Education, 11*(2), 301–318. http://doi.org/10.22342/jme.11.2.7946.301-318

Wilkins, J. L. (2010). Modeling quantitative literacy. *Educational and Psychological Measurement*, *70*(2), 267–290. https://doi.org/10. 1177/0013164409344506

Yang, C. C. R., & Chen, Y. (2020). Implementing the flipped classroom approach in primary English classrooms in China. *Education and Information Technologies*, *25*(2), 1217–1235. https://doi.org/10.1007/s10639-019-10012-6

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage

Yong, D., Levy, R., & Lape, N. (2015). Why no difference? A controlled flipped classroom study for an introductory differential equations course. *Primus*, *25*(9-10), 907–921. https://doi.org/10.1080/10511970.2015.1031307

Yoon, S., Kim, S., & Kang, M. (2020). Predictive power of grit, professor support for autonomy and learning engagement on perceived achievement within the context of a flipped classroom. *Active Learning in Higher Education*, *21*(3), 233-247. https://doi.org/10.1177/1469787418762463

Yorganci, S. (2025). The impact of synchronous online discussions and online flipped learning on student engagement and self-regulation among preliminary undergraduates in a basic math course. *Educational technology research and development*, 1–32. https://doi.org/10.1007/s11423-025-10459-0

Yükseköğretim Kurulu, [Board of Higher Education] (2018). *İlköğretim matematik öğretmenliği lisans programı* [Elementary mathematics teaching undergraduate program]. Board of Higher Education.

Zhang, H. (2023, June). Hierarchical Teaching Practice Based on Majors and Applications of Mathematica in Advanced Mathematics. In *2023 4th International Conference on Education, Knowledge and Information Management (ICEKIM 2023)* (pp. 33–41). Atlantis Press.

Zulkarnaen, R. (2018, October). *Why is mathematical modeling so difficult for students?* In *AIP Conference Proceedings* (Vol. 2021, No. 1, Article 060003). AIP Publishing. https://doi.org/10.1063/1.5062790

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REASONS WHY GIFTED STUDENTS DROPOUT OF SCIENCE AND ART CENTERS

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Abstract

Gifted students gain the right to receive education outside of school at the Science and Art Centers (SACs) affiliated with the Ministry of National Education and begin to receive education in these institutions in Turkiye. However, after a while, it is seen that gifted students drop out of SACs. The purpose of this research is to examine the reasons why gifted students drop out of SACs. For this purpose, the study group consists of 26 primary and upper-secondary school students who were entitled to SACs in the Black Sea region, attended for at least one year and then dropped out. The study group was formed by criterion sampling. A semi-structured interview form consisting of four questions, one about demographic characteristics and three about opinions, prepared by taking expert opinion, was used as the data collection tool in the study. The obtained data were subjected to content analysis. Depending on the data obtained, student opinions were analyzed under three themes within the perspective of self-determination theory. Regarding SACs dropout, codes have been formed as differentiated education, teacher competency, deep learning, school time, compulsory attendance, and design SACs completely like a school.
Keywords: *gifted students, dropout, reasons, science and art center, self-determination theory.*

Introduction

The phenomenon of gifted students dropping out of school presents a paradox for educators and researchers (Matthews, 2006). Estimates of dropout rates among gifted students differ across studies, largely due to varying definitions and criteria used to identify giftedness. Although the body of research on this topic is limited, findings suggest that gifted students disengage from school for diverse reasons, many of which parallel those found among the general student population. Contributing factors include chronic absenteeism, academic failure, negative attitudes toward school, substance abuse, learning difficulties, and familial discord (Cramond et al., 2007; Hansen & Toso, 2007; Matthews, 2006; Renzulli & Park, 2000, 2002). These causes are commonly categorized into psycho-emotional, social, and educational domains.

A primary factor contributing to dropout among gifted learners is disengagement, which occurs when curricula do not address their advanced intellectual needs, resulting in boredom, disruptive behavior, and absenteeism (Landis & Reschly, 2013; Susantya & Hawadi, 2019). Engagement may be conceptualized across four dimensions: academic, behavioral, affective, and cognitive. Behaviorally, gifted dropouts often display minimal class participation, strategic truancy just below tracking thresholds, and offtask behaviors such as "fooling around" or skipping assignments (Cramond et al., 2007; Kanevsky & Keighley, 2003). Affective engagement is similarly low: many gifted underachievers report feeling unsupported by teachers and isolated from peers, with nearly onethird attributing their departure to conflicts with staff and roughly 20% to a lack of belonging (Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). Although families typically maintain high expectations and advocate for continued education, such support does not always translate into effective assistance (Hansen & Toso, 2007;

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Renzulli & Park, 2000, 2002). Cognitively, gifted dropouts frequently describe coursework as unchallenging "busy work," leading to boredom and diminished valuation of school tasks (Cramond et al., 2007; Kanevsky & Keighley, 2003). Consequently, many exhibit unclear future goals and underdeveloped selfmanagement skills, including inadequate study strategies and time management (Landis & Reschly, 2013). When aggregated under a single framework, the primary reasons for dropout among gifted learners include boredom, perceived disrespect, an insufficiently challenging curriculum, lack of individualized pacing, limited opportunities for independent study, and inadequate teacher support (Zabloski, 2010). In a similar vein, Camper (2019) identified four major categories of dropout causes: family discord, lack of school engagement, absence of role models, and minimal family involvement. Moreover, twice-exceptional students–those who are gifted yet also experience learning disabilities–face a dual exceptionality that can precipitate academic failure and subsequent withdrawal. Finally, deficits in selfregulation and executive functioning have been implicated as additional contributors to dropout among gifted populations (Hartman, 2016).

Social factors exert a profound influence on the educational engagement and outcomes of gifted students. Peer-related dynamics–including bullying, social exclusion, and the imperative to conform–can discourage gifted learners from fully participating in school activities and may prompt them to understate their abilities (Ronksley-Pavia & Neumann, 2020). This tendency is especially pronounced during adolescence, when social acceptance is pivotal; negative peer encounters often precipitate declines in academic performance and elevate the risk of school dropout (Dada & Akpan, 2019). Family relationships further differentiate achievers from underachievers: research indicates that gifted students who underperform or disengage frequently report unsupportive parental behaviors–such as rejection and aggression–whereas high-achieving peers experience accepting and nurturing family environments (Hartman, 2016). Moreover, when educators and schools do not recognize and accommodate the distinctive social and emotional needs of gifted learners, these students may develop feelings of unfulfillment and perceive academic pursuits as lacking intrinsic value (Blass, 2014).

Socioeconomic factors play a significant role in the dropout rates of gifted students, particularly those from low-income and minority backgrounds. Limited access to resources and support systems hampers their academic success, with underrepresentation in gifted programs often driven by systemic biases that favor higher-income students (Grissom vd., 2019; Renzulli & Park, 2000). This inequitable access exacerbates the challenges these students face, leading to feelings of disenfranchisement and disengagement (Yu vd., 2020). Therefore, creating supportive school environments that encourage gifted students to embrace their talents is essential for preventing disengagement. The combination of socioeconomic factors and peer dynamics further complicates the challenges faced by gifted students. Those from lower socioeconomic backgrounds often lack opportunities to connect with peers who share similar academic interests, resulting in feelings of isolation (Yu vd., 2020). Systemic inequities, such as limited access to specialized gifted programs, especially for students from diverse or lower socioeconomic backgrounds, further reduce engagement (Kettler vd., 2015)029. Addressing these interconnected factors is essential for improving retention and supporting the academic success of gifted students. This absence of a supportive peer group can undermine their motivation and engagement, ultimately increasing the likelihood of dropping out (Dada & Akpan, 2019). As such, both socioeconomic limitations that restrict access to resources and negative peer influences that discourage academic involvement contribute to higher dropout rates among gifted students. Tackling these issues requires a holistic strategy that improves access to gifted education and fosters positive peer environments to enhance their academic experiences.

Teachers lacking specialized training in differentiated instruction may inadvertently intensify gifted students' disengagement by failing to meet their advanced learning needs

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(Kettler et al., 2015). Indeed, many identified gifted students report enduring years of uniform, slow-paced instruction that fails to address their distinctive needs (Schmitt & Goebel, 2015). When gifted learners are neither sufficiently challenged nor supported through pedagogical approaches aligned with contemporary learning theories, they often experience social isolation, diminished valuation of their studies, and ultimately may choose to withdraw from educational continuity (Landis & Reschly, 2013). Consequently, these learners frequently encounter inappropriate academic challenges, which can depress performance–a well-established predictor of dropout (Kettler et al., 2015). Furthermore, the variability in intellectual levels (mild, moderate, high, and exceptional) without corresponding instructional adjustments can exacerbate disengagement (Hartman, 2016). When considering the engagementrelated, social, and academic factors described above, it can be argued that dropout among gifted students stems from the thwarting of their fundamental psychological needs for autonomy, competence, and relatedness, which in turn impairs their wellbeing, selfregulatory skills, and motivation. Accordingly, this study employs SelfDetermination Theory to elucidate the underlying causes of dropout and to interpret its findings.

Theoretical Framework

Despite possessing exceptional cognitive abilities, many gifted students fail to fully realize their potential (Worrell et al., 2019). One frequently cited explanation for this underachievement is a lack of student engagement, which has also been identified as a contributing factor to school dropout (Preckel et al., 2006). According to self-determination theory (SDT), student engagement is enhanced when the basic psychological needs for autonomy, competence, and relatedness are met (Deci & Ryan, 1985). These needs function as intrinsic motivational resources that, when supported, promote optimal functioning and psychological well-being (Ryan & Deci, 2000a). Each of these needs is associated with fostering independence, encouraging persistence, and supporting risk-taking by facilitating the internalization of values and goals. When the social environment effectively nurtures these psychological needs, it fosters personal growth and development (Ryan & Deci, 2000b).

Autonomy constitutes the driving force behind self-organized behaviors, such as when individuals are afforded opportunities for choice and self-directed learning. It embodies a perceived internal locus of control, whereby individuals regard themselves as the originators of their own actions (Deci & Ryan, 1985). The need for autonomy describes the inherent desire to act as causal agents and to experience volitional regulation of behavior (Deci & Ryan, 1985; Ryan & Deci, 2000b). An autonomy-supportive instructional context is characterized by the provision of meaningful choice, clear explanations of task relevance, acknowledgement of students' negative affect, and the cultivation of their intrinsic motivational resources (Stroet et al., 2013). Empirical evidence indicates that autonomy-supportive practices–such as offering choices and designing relevant learning experiences–enhance intrinsic motivation among gifted learners (Garn & Jolly, 2014). Furthermore, gifted students whose autonomy needs are satisfied demonstrate higher levels of engagement in academic tasks (Miserandino, 1996).

Competence drives mastery by focusing on the learning process over outcomes and reflects one's belief in performing tasks at an expected level (Deci & Ryan, 1985). The need for competence involves feeling effective and extending one's abilities, which teachers can support through clear structure, contingent feedback, and appropriately tailored materials (Jang et al., 2010; Stroet et al., 2013). Although gifted students often appear competent (Suldo et al., 2018), they may face pressure to meet unrealistic standards (Kesner, 2005) and fear judgment on their intellectual performance, with low selfperceived competence linked to lower engagement. Encouragement via high expectations and challenging tasks is especially effective, yet teachers sometimes offer gifted learners less structure, assuming they require less guidance (Deunk et al., 2018).

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Relatedness denotes the fundamental need for interpersonal connection, manifesting when educators express genuine empathy and take an active, noncontrolling interest in students' learning. It pertains to the development of emotional bonds with significant others, including teachers and peers. The need for relatedness involves the desire to feel connected and to experience a sense of belonging. Educators can foster relatedness by demonstrating involvement in students' lives, conveying care and affection, attuning to individual needs, and providing emotional support (Stroet et al., 2013). Among gifted learners, relatedness has been identified as the most valued teacher characteristic, followed by competence and autonomy (Bakx et al., 2019). Positive relationships with both teachers and classmates support this need; however, gifted students often report less positive teacher relationships compared to their peers in specialized programs, suggesting challenges in meeting their socioemotional needs. Consistent with findings from general classroom populations (Stroet et al., 2013), autonomy support and teacher involvement enhance gifted students' relatedness satisfaction and, consequently, the quality of their motivation–an effect that may mitigate underachievement.

Experimental studies and longitudinal investigations have demonstrated that autonomy-supportive teaching–characterized by an interpersonal tone of empathy and understanding, perspective taking, and opportunities for student initiative–promotes positive classroom outcomes, including engagement, conceptual learning, and well-being. These benefits arise because autonomy-supportive instruction nurtures students' basic psychological needs for autonomy, competence, and relatedness. Such environments cultivate students' inherent motivational resources by offering choice and self-direction, delivering affirmative and constructive feedback, employing informal and noncontrolling language, and explicitly linking classroom structures (e.g., rewards, expectations) to their significance for learning and well-being (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). Moreover, well-structured, warm, and responsive contexts predominantly satisfy all three needs by fostering clarity, connectedness, care, and mutual understanding within the classroom community.

Research Problem

In the context of Turkiye, different models have been applied for the education of gifted students, one of which is Science and Art Centers (SACs) (Bildiren & Çitil, 2022). Gifted students attend SACs as an after-school support education program. These are institutions established to provide support education services to students attending public educational institutions who have special talents in the fields of general cognitive, visual arts or music, in order to develop their talents and enable them to use them at the highest level. Since their establishment, SACs have been the focus of numerous studies. Research has revealed that teachers face various challenges in personal, educational, and administrative areas within SACs (Bozan - Savi Çakar, 2020). Despite some parents expressing concerns about SACs, particularly regarding time demands and fatigue, they acknowledge the centers' contributions to their children's scientific, mental, individual, academic, and social development, and wish for their continuation (Büyüktokatlı & Kurnaz, 2020). Additionally, parents of gifted children often struggle with recognizing and understanding their children's unique talents, responding to their questions, and addressing their mental, social, emotional, and personality traits, as well as communication skills and problem-solving (Çamdeviren, 2014). Another study examining SACs implementation in terms of education, guidance, physical resources, and school-environment cooperation, based on teacher perspectives, found that while education and guidance services were adequate, physical resources and cooperation between schools and the centers were insufficient (Sezginsoy, 2007).

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Research Aim and Research Question

Overall, studies have evaluated SACs from various perspectives (Kılıç, 2015). While SACs support the education of gifted students, they are often viewed as inefficient, with significant issues related to gifted education in Turkiye (Öğülmüş & Sarı, 2014). Despite extensive research on SACs, where gifted students receive education in Turkey (Karakuş, 2010), studies specifically focusing on dropout rates and their causes in SACs are limited. Absenteeism is mentioned infrequently, and dropout is rarely explored as a direct research problem, often emerging as an unexplored outcome of another research. In light of this, the aim of the current study was to examine the perspectives of gifted students attending SACs regarding the reasons for their dropouts.

What reasons do gifted students who have attended SACs perceive as contributing to program dropout?

Research Methodology

General Background

This study employed a qualitative research design using the case study approach. Case study research is a method of analyzing events experienced by individuals, groups, communities, or units within a specific scientific framework (Creswell & Baez, 2017). This approach allows for an in-depth examination of events, providing a comprehensive understanding within the context of real-life situations (McMillan, 2004). Single case studies are particularly valuable for verifying theoretical knowledge, documenting rare or unusual occurrences, monitoring the same cases over different time periods, and investigating hard-to-reach phenomena (Yin, 2014).

In this context, the study explored the perspectives of gifted students eligible for after-school support programs (SACs) regarding their reasons for leaving the program, employing a qualitative case study design. This research is an exploratory, descriptive case study with the aim of investigating the factors underlying the dropout phenomenon, capturing the experiences and viewpoints of gifted students. The study was conducted over a six-month period, with data collection occurring between January and June 2024. The scope of the research was limited to a small, purposive sample of gifted students who had dropped out of after-school support programs.

Sample

The study group consists of 26 lower and upper-secondary students, identified as gifted in the 2023/2024 academic year in a Black Sea province, who attended SACs for at least one year before dropping out. Purposive sampling was used to select students meeting the criteria of giftedness and having attended SACs, ensuring accurate and detailed responses to the research questions. The group includes 8 lower-secondary and 5 upper-secondary students from private schools, and 7 lower-secondary and 6 upper-secondary students from public schools.

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Table 1
Demographic Attributes

Variable	Variables	*Frequency*
Gender	Female	14
	Male	12
Level	Lower-secondary	15
	Upper-secondary	11
Gifted area	General ability	21
	Music	3
	Art	2

Instrument and Procedures

Data were gathered through semistructured interviews, a standard qualitative technique (Creswell, 2017). The interview guide comprised openended questions crafted to address the study's aims and to draw out rich participant perspectives. To establish reliability and validity, the instrument was developed in several stages. Initially, a comprehensive literature review on gifted student dropouts. The draft questions were then evaluated by experts in the field to assess their clarity, relevance, and suitability for the target population. Based on expert feedback, a pilot study was conducted with two students to identify and revise ambiguous or biased items. The final version of the interview form incorporated this feedback, ensuring clarity, appropriateness, and consistency across interviews. Final revisions ensured consistency and suitability for the target group. Sample questions are as follows: *What were your expectations regarding the education and instruction offered at SACs prior to your enrollment? To what extent did your experiences at SACs align with your initial expectations in terms of educational and experiential aspects? Could you explain the reasons for discontinuing your participation in SACs? What were the main factors influencing this decision?* Data were collected at the SACs, with interviews conducted before, during, and after student sessions. Participants were informed about the study's purpose, and consent for audio recording was obtained verbally and in writing. Each interview lasted approximately 20–25 minutes.

Data Analysis

Qualitative content analysis was employed to analyze the data, which were initially transcribed from audio recordings to facilitate a focus on the interpretation and meaning of the content rather than on the quantification of elements. This method is well-suited for exploring how individuals experience, perceive, and construct meaning within a specific context. It supports an inductive approach, allowing themes to emerge organically from the data rather than being constrained by predetermined categories. Furthermore, it enables adaptive coding, wherein categories are refined and developed iteratively throughout the analytical process. The analysis followed four stages: 1) naming, coding, and extraction, 2) theme development, 3) ensuring validity and reliability, and 4) reporting.

Thematic analysis was conducted through a structured and iterative process. Initially, two independent researchers (coder 1 and coder 2) familiarized themselves with the data by repeatedly reading four transcripts without annotation. The first coder then re-read the transcripts to generate preliminary codes reflecting meaningful content. During coding, mnemonic memos (Charmaz, 2006) were used to interpret codes, explore relationships, and propose emerging

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themes. Researchers collaboratively reviewed and refined the codes, reaching consensus and identifying three themes for the student, four for the mother, and three for the teachers. These themes were evaluated for consistency with the coded data and the broader dataset. Refinement involved clarifying theme boundaries, labels, and meanings in line with thematic analysis principles. A final review ensured coherence and alignment with the study's aims. Representative participant quotes were selected to illustrate key themes, which were then integrated with the research questions and relevant literature to complete the analysis.

To enhance the validity and trustworthiness of the findings, the study employed member checking, expert review, and thick, rich descriptions (Patton, 2014), all standard strategies in qualitative research. Member checking involved sharing the final report with participants, all of whom confirmed the accuracy of their statements. Expert review was conducted by two specialists in twice-exceptionality and qualitative research, who validated the alignment of the analysis with the study's objectives. Participant statements were included directly in the findings to offer detailed insights into the phenomenon. Trustworthiness was further addressed through credibility, dependability, transferability, and confirmability. Credibility was supported by independent coding of transcripts by two qualitative research experts, followed by collaborative theme refinement. Dependability was ensured through participant feedback to correct potential errors or misinterpretations. Purposeful sampling and detailed presentation of participant narratives enhanced transferability (Creswell & Baez, 2017), while expert review contributed to confirmability by providing an objective evaluation of the analysis.

Research Results

In this part of the study, the findings obtained in the study as a result of the data analysis are discussed under 3 theme headings; these headings are listed as expectations, reasons for dropouts, and suggestions, respectively. The codes related to the first theme are given in Table 2.

Table 2
Gifted Students' Expectations from SACs

Codes	Frequency	The Students
High level progress	5	S1, S3,S11,S16,S21
Lesson support	7	S2,S4,S5,S7,S12,S20,S23
Differentiated education	6	S8,S13,S17,S22,S24,S26
No expectation	8	S6,S9,S10,S14,S15,S18,S19,S25

As can be seen in Table 2, when the expectations of gifted students towards SACs are analyzed, it is seen that some of the participants stated that their expectations from SACs are that the institution is a place where courses are taken and school lessons are supported. Some students anticipated a structured course format, similar to their other academic subjects, where they would systematically learn new techniques, skills, and concepts in painting. Some students felt that the institution should incorporate or relate more to traditional academic subjects, viewing it as an opportunity to reinforce or enhance their understanding in Turkish, math, science, and social studies. The opinions of some of the participants on this subject are as follows:

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'*I thought this program would be more like a class, where we'd go step-by-step and learn new things about painting. I was hoping to pick up new skills and techniques that would help me improve my art.*' (S2).
'*I expected the program to focus more on main subjects like Turkish, math, science, and social studies. I thought it would help me strengthen these core areas, which are really important for school.*' (S5).
'*I joined because I thought it would help me with my schoolwork and improve my grades. I was looking forward to learning things that would make a difference in how I do in my classes.*' (S7).

Some of the participants stated that their expectations from the SACs are that the institution is different from the school and more fun. Each student seems to be craving a more engaging, detailed, and skill-focused approach to learning. They're looking for a way to make the material feel both useful and enjoyable. The opinions of some of the participants are as follows:

'*I thought we'd be doing different things. I was hoping to learn in a way that wasn't so boring and repetitive.*' (S13).
'*I expected more hands-on activities outside of school, related to what we're studying. I thought we'd dive deeper into topics and really get into the details.*' (S17).
'*I wanted to learn new things, have fun, and get a change of pace. I figured the lessons would be tailored more to my skills, helping me develop them further.*' (S26).
'*I wanted to learn about different things in more depth. I was hoping to expand on what I already knew but also get into some new ideas and topics.*' (S12).

Some of the participants stated that their expectations from the SACs were that they expected the SACs to support and improve their skills at a high level. Overall, each student is looking to challenge themselves and make real progress in areas that matter to them, whether that's by learning more advanced material, building specific skills, or improving in a particular field like robotics or music. They're aiming for personal growth and specialized learning that goes beyond the basics. When the students were asked if SACs met their expectations, most of them stated that they did not find what they expected. The opinions of some of the participants are as follows:

'*I was hoping for a chance to learn at a higher level. I wanted to study things that go beyond what we usually cover in my grade level and to get into more advanced topics.*' (S3).
'*I thought this program would help me get better in robotics. I expected to learn new skills or techniques that would really improve what I can do in that field.*' (S11).
'*I wanted to grow in music. I thought I'd get the chance to work on my skills, learn new things, and become better at it.*' (S21).

Table 3
Reasons of Dropouts

Codes	Frequency	The Students
Teaching method	10	S1,S5,S7,S8,S9,S12,S15,S16,S24,S25
School time	5	S2,S5,S6,S21,S23
Teacher competency	9	S10,S11,S14,S17,S19,S20,S22,S24,S26
Conflict between project logic and examination system	2	S13,S17
Compulsory attendance	3	S3,S4,S18

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As can be seen in Table 3, when the reasons for the participants to leave SACs were analyzed, it was seen that the participants mostly stated that they were bored with the same activities and methods. Each student is frustrated by how the program felt too similar to regular school. They expected something different and more engaging–whether that was new material, hands-on projects, or activities that connected with their specific interests. They wanted variety, excitement, and a chance to explore things in a new way, but instead, they felt stuck in a repetitive routine. When the opinions of some of the participants are analyzed, their opinions are as follows:

> '*I ended up quitting because we were just doing the same things over and over again in class. For example, we were always drawing perspectives, and it got repetitive. There was nothing new or exciting.*' (S1).
> '*I got bored with the lessons. They felt just like regular school classes. We kept covering the same stuff we already did in school, so it didn't feel like I was learning anything new.*' (S7).
> '*The classes were basically run like school. We had regular classes during the week, then even more on Saturdays and weekends, just like we already have at school. I'm interested in mechanical engineering, and I really wanted to work with materials and do hands-on projects that would let me explore that interest. Instead, it felt like the same old routine, without any activities that would actually help me learn more about what I'm interested in*' (S15).

Some participants stated that they dropped out because the school hours were not suitable. Both students are feeling worn out from their packed schedules. After a full day at school, jumping right into a few more hours of classes leaves them with little time for themselves and no chance to unwind. They're hoping for a schedule that's a bit more manageable and less draining. When the opinions of some of the participants are analyzed:

> '*The timing was tough for me. I was already spending a lot of time at school, and then I'd have to go straight to this program right after school, starting at 5 p.m. and staying until 8 p.m. It really cut into my personal time, and I just felt exhausted by the end of the day.*' (S2).
> '*It's hard going straight from school to the program. After being in school for 8 hours, going directly to more classes was just way too tiring.*' (S6).

Some participants stated that there were problems with teacher competence. Each student is feeling some frustration about the support and resources available to them. They're interested in specific areas or advanced projects, but they aren't getting the guidance or opportunities they need. Whether it's a lack of interest from the teacher, limited knowledge in their chosen field, or just not enough hands-on activities, they're left wanting more. The views of some of the participants are as follows:

> *'Most of the time, my teacher didn't really seem interested in what I was into. I don't know, maybe they didn't know much about the field I was interested in, but it felt like we just weren't on the same page.*' (S10).
> '*When I was working on a project, I didn't get much support from my teacher. I'd go to them with ideas, but I couldn't move forward because I didn't get the guidance I needed to take the next steps.*' (S14).
> '*My teacher was willing to help, but we couldn't do anything at a higher level, like experiments or hands-on activities. We just didn't get to go beyond the basics.*' (S19).

Some participants reported problems with attendance tracking. Both students feel overlooked. When they stopped attending, no one followed up or showed concern, so they felt unmotivated to continue. It seems like they expected more communication or engagement from the program, especially if they were absent, but the lack of follow-up made them feel like their presence didn't matter. The opinions of some of the participants are as follows:

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'*There was a lot of miscommunication. I missed a couple of classes at the start of the year because the lessons seemed too basic for me, and no one reached out or asked why I wasn't showing up. It felt like no one even noticed I was gone, so I just didn't bother going back.*' (S11).
'*Hardly anyone was showing up to the classes, and after a while, I just stopped going too. Nobody called to check in or ask why I wasn't coming anymore, so I figured it didn't matter.*' (S20)

Some participants reported a conflict between the project logic and the examination system. Both students felt that attending SACs wasn't worth their time because it didn't directly contribute to the entrance exams they were focused on. They needed something that would actively boost their scores or improve their chances, so without those benefits, they chose to put their energy into studying for the exams instead. The views of some of the participants are as follows:

'*Going to the SACs didn't give me any extra points or benefits for my high school entrance exam. So I decided it was better to just focus on preparing for the exam instead of spending time on something that wouldn't help my score.*' (S13).
'*The SACs didn't give me any advantage for my university entrance exam–no bonus points or anything like that. Since it didn't help with my score, I figured there was no point in continuing.*' (S17).

Table 4
Suggestions Regarding SACs

Codes	Frequency	The Students
Teaching method	10	S5,S7,S8,S9,S12,S13,S16,S24,S25,S26
School time	4	S2,S6,S21,S23
Teacher competency	7	S1,S5,S9,S10,S14,S16,S25
Full-time school	2	S11,S19
Compulsory attendance	3	S3,S17,S20

As can be seen in Table 4, when the participants' suggestions for SACs are analyzed, it is seen that they mostly expressed their opinions in the form of curriculum and method improvement. Students are looking for a learning experience that feels unique and challenging, something that goes beyond the standard school setup. They're hoping for shorter, more engaging lessons that focus on new and more advanced material. Instead of just covering the basics or repeating what they get at school, they want an environment that keeps them curious and excited to learn. The opinions of some of the participants are as follows:

'*Lesson hours should be shorter. Lessons should not be like High School Entrance Exam preparation at school. They should be made interesting. It should be more detailed and challenging.*' (S7).
'*I think it should be a place that is different from school and keeps curiosity alive. I entered from general aptitude. Recently, I left it because it did not meet my expectations and started to take lessons from a private tutor. It should not be like at school, but higher, more difficult, that is, there should be things that are not given in normal school.*' (S12).

Some of the participants stated that the school hours were appropriate. The opinions of some of the participants are as follows:

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'*Making the school time more appropriate. Even if it is after school, I would like to be given time to rest and I would like the lessons to be shorter.*' (S2).
'*Lesson hours should be adjusted. There should not be 4 hours of lessons in one day. Instead, there should be one or at most two hours of lessons after school.*' (S6), '*SACs should not be after school on weekdays. Its hours should not conflict with the school.*' (S21).

Some of the participants expressed opinions about teachers. The opinions of some of the participants are as follows: 'If the teacher could teach different things. For example, different things from nature could have been collected and drawn. Thus, I would be more willing.' (S1)

'*Our teachers should be able to support the ideas we present and guide us. Even if I have an idea, I don't know what to do.*' (S10).
'*The teacher working in SACs should be better equipped.*' (S14)

Some of the participants stated that SACs should be just like a school and should not be a separate program. The opinions of some of the participants are as follows:

'*In my opinion, it should be like a separate school. Class hours should change. When the student wins there, he/she should continue there completely. He should be a student there.*' (S11).
'*When there is exam anxiety, school and SACs do not work together. If we have won the exam, we can take the lessons there. For this, it should be like a school. In other words, students who win should study there now. If this happens, the lessons will be fuller and there will be no shortage of time.*' (S19).

Discussion

This study was aimed at investigating why gifted students drop out of after school programs (SACs) in the Turkiye sample. Findings indicated that gifted students expected SACs to offer structured, academically rigorous extensions of their schoolwork–teaching new skills and reinforcing core subjects–but found the programs' repetitive, schoollike activities disengaging. Consequently, many withdrew, citing boredom and a lack of handson, interestdriven projects. To address this, they recommended shorter, more dynamic sessions featuring advanced content, projectbased learning, and flexible structures that allow choice and deeper exploration, thereby providing the intellectual challenge and novelty they seek. Considering all these, it is seen that there is a lot of emphasis on problems such as teacher competence, teaching methods, and the fact that the extra burden of going to these centers does not turn into an advantage. These and similar results were expressed in several studies (Çelik-şahin & Şahin, 2014; Taşdemir, 2020).

From the point of SDT, under autonomy sub-dimension, students reported wanting far more choice in their learning (courses, projects, activities). They said being forced into irrelevant or low-preference options was demotivating. They emphasized needing freedom to be creative and make decisions – for example, wanting to personalize aspects like school uniforms and feeling they "should be trusted to make good choices" in their learning path. This sense of ownership (rather than control) was important for engagement. Many pointed out that a rigid, repetitive curriculum undermines autonomy. Students complained of "the same old boring" teaching methods and too many simultaneous assignments, which made them feel stressed and disengaged. They asked for more varied, creative instruction and manageable pacing (e.g., spacing out homework) to feel autonomous in their studies. Autonomy-supportive instruction encompasses several key strategies: offering students meaningful choices, articulating the significance of tasks, acknowledging and validating their negative emotions, and fostering intrinsic motivational resources (Stroet et al., 2013). In an exploratory investigation, Garn and Jolly (2014) demonstrated that elements such as choice provision and contextually

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relevant learning experiences enhanced intrinsic motivation among gifted learners. Similarly, Miserandino (1996) reported that when gifted students perceived their autonomy needs as fulfilled, their engagement in academic activities increased. Although these studies did not directly compare gifted and nongifted populations, their outcomes align with broader research indicating that satisfaction of autonomy needs underpins student motivation (Stroet et al., 2013). Consistent with findings in general education contexts, the present research reveals that teacher practices characterized by autonomy support and active involvement bolster need satisfaction and, consequently, the quality of motivation in gifted students. Intriguingly, despite teachers' reports of providing slightly more autonomy support to gifted learners, these students did not report greater autonomy satisfaction than their nongifted peers, suggesting a comparatively higher autonomy requirement among gifted individuals (Hornstra et al., 2020). Accordingly, creating social environments that simultaneously satisfy autonomy, competence, and relatedness is pivotal; such settings are autonomysupportive, wellstructured, warm, and responsive (Ryan & Deci, 2017). Specifically, autonomysupportive classrooms nurture internal motivation by granting selfdirection and choice, employing noncontrolling language, delivering constructive feedback, and explicitly linking classroom structures–such as expectations and rewards–to their pedagogical value (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). Meanwhile, wellstructured and empathetic interactions foster need satisfaction by promoting clarity, belonging, and mutual understanding (Vansteenkiste et al., 2012).

From the perspective of SDT, under competence sub-dimension, students reported feeling competent when teachers provided clear explanations and were available for questions. They appreciated when instructions were made understandable – one student noted that if the task was well explained, they felt capable of doing it – and when teachers encouraged them to ask questions. This instructional clarity helped students grasp the material and feel capable. Students identified an appropriately calibrated workload as essential to their sense of competence. Tasks that were "neither under nor overdemanding," aligned with their current capabilities while also scaffolding preparation for forthcoming objectives (e.g., examinations), elicited the strongest feelings of competence. Conversely, homework that was overly simplistic prompted boredom, whereas assignments exceeding students' skill levels induced discouragement. When educators designed challenges that optimally stretched students' abilities without precipitating overwhelm, learners perceived opportunities for growth and skill acquisition. Furthermore, affirmative feedback and evaluative comments reinforced students' competence beliefs: one pupil reported that public praise by a teacher significantly bolstered her confidence. Both grades and constructive remarks that evidenced incremental progress contributed to learners' conviction that they were succeeding. Overall, timely, supportive feedback engendered heightened selfassurance regarding learning. Students consistently linked the mastery of novel skills with "immense happiness" and the gratification of achievement; in contrast, failure to comprehend new material evoked discouragement. They underscored that engaging, meaningful tasks fostered a perception of continuous advancement. Thus, challenging yet attainable assignments coupled with visible progress underpinned elevated learning satisfaction and selfconfidence. Although gifted students might be presumed to experience pervasive competence due to their intellectual aptitude (Suldo et al., 2018), they may also grapple with unrealistic performance expectations (Kesner, 2005) and anxiety about maintaining a "smart" image. Indeed, some evidence suggests that teachers provide highability learners with reduced structural support, presuming they require less guidance than their peers (Deunk et al., 2018).

Students emphasized the importance of relatedness, valuing instructors who deliberately cultivate a sense of inclusion. They reported feeling welcomed when teachers proactively introduced newcomers to the class, and noted that interpersonal rapport–such as educators learning about their hobbies or sharing personal anecdotes–enhanced their sense of being supported as individuals. Mutual respect emerged as a central theme: learners preferred mentors

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who guide rather than punish, and who both respect student perspectives and remain open to learning from them. Ongoing communication and affirmative encouragement were identified as critical mechanisms through which students experienced connection and affirmation in the classroom. Peers likewise constituted a vital source of relatedness. Trusting friendships and collaborative activities–whether in sports, games, or project work–reinforced students' belongingness, as shared interests fostered companionship and solidarity within the school community. Echoing these findings, research on gifted student attrition highlights the role of student–teacher relationships and the quest for alternative educational pathways. Gifted learners frequently perceive neglect from instructors, a factor that significantly contributes to dropout decisions; many subsequently pursue tailored programs or selfdirected learning as a "fresh start" (Hansen & Toso, 2007). Moreover, school withdrawal has been linked to both individual and institutional causes–including inadequate teacher competence, unsupportive social climates, and emotional disengagement. Dropouts commonly recount negative experiences such as placement alongside lowachieving peers, uninspiring instruction, and academic failure. Feelings of boredom, devaluation, and social disconnection often accompany these experiences, and students cite unengaging or dismissive teachers as exacerbating their emotional withdrawal and undermining their motivation to remain in school.

Findings also indicated that the dropout reason was associated with organizational issues. Similar results were also supported by other studies. For instance, students' motivation and energy may decrease during activities at SACs on top of the fatigue of school (Çelik-şahin & Şahin, 2014). Again, in support of these findings, when the reasons for dropout are examined, it is stated that there are problems such as the intensive course period, exam preparation, lesson processing at SACs as in school, school exams, and studying at boarding school (Taşdemir, 2020). Teachers approached this and similar problems from different perspectives and stated that they were related to the logistic facilities of the institution (Bozan & Savi Çakar, 2020; Öğülmüş & Sarı, 2014; Sezginsoy, 2007).

Addressing the unique needs of gifted students requires a multifaceted approach that includes providing holistic resources. By understanding and addressing the factors that contribute to dropout rates among gifted students, educators and parents can help these students realize their full potential. As a result, starting with diagnostics, perhaps program-based diagnostics and meeting student interests and needs, paying attention to the pre-service and in-service training of teachers working in these institutions, evaluating the logistical needs of these institutions in a holistic way, and making program arrangements that take into account both the physical, social and emotional needs of students, ensuring teacher-student-mentor relationships in project processes, amendment of the regulation on both attendance-absenteeism and uncertainties regarding SACSs and, most importantly, providing a differentiated teaching process can prevent gifted students from dropping out of these after school programs.

Conclusions and Implications

Gifted learners entered SACs anticipating these programs to serve as academically rigorous continuations of their regular schooling–offering structured modules to systematically cultivate new abilities, particularly in visual arts, and to reinforce core subjects such as Turkish, mathematics, science, and social studies. However, participants commonly reported disengagement when SAC instruction consisted of repetitive exercises and traditional pedagogies nearly indistinguishable from their r classrooms. This didactic monotony fostered boredom and, in many cases, led to program withdrawal, as students yearned for novel, handson projects and content aligned with their personal interests. Consequently, they advocated for a comprehensive overhaul of SAC curricula and instructional approaches: shorter, more dynamic sessions featuring advanced or specialized topics; projectbased and learnerdriven activities; and

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a flexible framework that grants autonomy and enables indepth exploration. Such innovations, they contend, would more effectively satisfy their intellectual curiosity, maintain engagement, and differentiate SACs from standard classroom experiences.

Preventing underachievement and attrition among gifted students may be informed by broader dropoutprevention research. Reschly and Christenson (2006) identify key strategies, including fostering supportive home and school contexts, easing transition between educational stages, and systematically monitoring engagement–all of which underscore the centrality of student engagement in averting highschool withdrawal. Evidence indicates that many gifted students lose interest during late elementary or early middle school (Cramond et al., 2007; Hansen & Toso, 2007), suggesting that engagement maintenance–rather than initiation–is critical. At the institutional level, Reschly and Christenson (2006) commend practices that offer "meaningful participation" and uphold high expectations for learners (p. 109). For gifted populations, this may involve differentiated instructional placements that match students' abilities, as well as robust encouragement to engage in extracurricular pursuits, which likewise correlate with positive academic persistence.

All in all, in order to prevent gifted students from dropping out after school programs, the following practical implications can be argued. For inclusive, respectful classroom environments, gifted students flourish in classrooms that both challenge and affirm them. By clustering learners of similar ability and compacting or accelerating the curriculum, teachers keep advanced students engaged and prevent boredom. Equally important is fostering a culture of respect and justice–establishing norms collaboratively, celebrating diverse talents, and validating the intense sensitivities many gifted children experience. For individualized curriculum, a onesizefitsall curriculum often underwhelms gifted students, leading to disengagement. Schools should implement individualized learning plans that allow acceleration (gradeskipping, compacting), enrichment activities, and subjectspecific pullouts or magnet programs. Offering abovegradelevel content, projectbased extensions, and partnerships with colleges or online providers ensures each learner encounters appropriately challenging material. For student engagement, sustained engagement hinges on connecting learning to students' interests and providing choice and autonomy. When gifted learners participate in selecting topics, designing projects, or leading seminars, their personal investment grows. Regular monitoring of engagement–through grades, attendance, and behavior–helps educators spot early warning signs of withdrawal. For mentoring, gifted students benefit enormously from consistent, caring relationships with adults and peers. Assigning each gifted learner a mentor–whether a teacher, counselor, or older peer–provides both academic guidance and socioemotional support. For family engagement, preventing gifted dropout requires strong partnerships between schools, families, and community resources. Schools should regularly communicate with parents–through meetings, workshops, and culturally responsive outreach–to help them understand and support their child's unique needs. In sum, preventing dropout in gifted education requires an integrated approach. Classrooms must be challenging yet nurturing; curricula must be rigorous and flexible; schools must foster strong relationships through mentoring and counseling; families must be engaged; and policies must prioritize gifted learners' needs. Each recommendation above is grounded in empirical studies of gifted dropout.

Limitations

Although the small sample size limits the generalizability of our findings, this study nonetheless offers a detailed descriptive account of gifted students' perspectives on dropout from SACs. Future research could build on these results by employing mixed-methods designs–collecting both qualitative and quantitative data from families, teachers, administrators, and students–to extend and validate the present work. Likewise, while this study relied exclusively

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on interviews as its qualitative data-collection tool, subsequent investigations might incorporate alternative qualitative methods (e.g., focus groups, observations) and adopt longitudinal designs to track changes over time. Our participants were drawn from a single geographic region; future studies should recruit from more diverse and representative populations. Finally, cross-cultural comparisons would further illuminate how socio-cultural contexts shape gifted students' experiences and decisions regarding school retention.

Ethics and Consent to Participate

Before the field applications in the research process, ethical approval was obtained from the Ethics Commission of the relevant university dated 10.05.2023 with decision number 293399.

References

Bakx, A., Van Houtert, T., Van den Brand, M., & Hornstra, L. (2019). Need supportive teaching for high-ability pupils: Comparing high-ability versus regular ability pupils' views of characteristics of good primary school teachers. *Educational Studies, 45*(1), 35–56. https://doi.org/10.1080/03055698.2017.1390443

Bildiren, A., & Çitil, M. (2022). Educating gifted children in Turkey: A retrospective analysis and the current state. *International Journal of Educational Reform, 31*(3), 278–299. https://doi.org/10.1177/10567879211050345

Blaas, S. (2014). The relationship between social-emotional difficulties and underachievement of gifted students. *Australian Journal of Guidance and Counselling, 24*(2), 243–255. https://doi.org/10.1017/jgc.2014.1

Bozan, İ., & Savi Çakar, F. (2020). Determining the problems experienced by Science and Art Center teachers and their suggestions for solutions to these problems. *Turkish Studies - Educational Sciences, 15*(3), 1607–1628.

Büyüktokatlı, N., & Kurnaz, A. (2020). Longitudinal evaluation of the education provided in Science and Art Centers according to family opinions. *Journal of Social, Humanities and Administrative Sciences, 3*(10), 757–774. https://sobibder.org/index.php/sobibder/article/view/120

Camper, B. M., Jr. (2019). *A case study analysis among former urban gifted high school dropouts* [Doctoral dissertation, Walden University].

Cramond, B., Kuss, K. D., & Nordin, R. G. (2007, August). *Why high-ability students drop out: School-related factors*. Paper presented at the World Conference for Gifted Children, University of Warwick, Coventry, UK.

Creswell, J. W., & Báez, J. C. (2020). *30 essential skills for the qualitative researcher* (2nd ed.). Sage.

Çamdeviren, Ş. (2014). *Difficulties faced by parents of gifted children attending science and art center (Sakarya province case study)* [Master's thesis, Sakarya University].

Çelik-Şahin, Ç., & Şahin, Ç. Ç. (2014). Examining the opinions of Science and Art Center students about these institutions. *HAYEF Journal of Education, 11*(1), 101–117. https://dergipark.org.tr/en/pub/iuhayefd/issue/8800/110001

Dada, O., & Akpan, S. M. (2019). Discriminant analysis of psycho-social predictors of mathematics achievement of gifted students in Nigeria. *Journal for the Education of Gifted Young Scientists, 7*(3), Article 3. https://doi.org/10.17478/jegys.605981

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum.

Deunk, M. I., Smale-Jacobse, A. E., de Boer, H., Doolaard, S., & Bosker, R. J. (2018). Effective differentiation practices: A systematic review and meta-analysis of studies on the cognitive effects of differentiation practices in primary education. *Educational Research Review, 24*, 31–54. https://doi.org/10.1016/j.edurev.2018.02.002

Garn, A. C., & Jolly, J. L. (2014). High ability students' voice on learning motivation. *Journal of Advanced Academics, 25*(1), 7–24. https://doi.org/10.1177/1932202X13513262

Grissom, J. A., Redding, C., & Bleiberg, J. F. (2019). Money over merit? Socioeconomic gaps in receipt of gifted services. *Harvard Educational Review, 89*(3), 337–369. https://doi.org/10.17763/1943-5045-89.3.337

Hansen, J. B., & Toso, S. J. (2007). Gifted dropouts: Personality, family, social, and school factors. *Gifted Child Today, 30*(4), 30–41. https://doi.org/10.4219/gct-2007-488

Hartman, E. H. M. (2016). *Factors influencing dropout behaviour of gifted students: The influence of giftedness indicators and environmental, personal, and demographical factors on gifted students' dropout behaviour in giftedness programs* [Master's thesis, University of Twente].

Hornstra, L., Bakx, A., Mathijssen, S., & Denissen, J. J. (2020). Motivating gifted and non-gifted students in regular primary schools: A self-determination perspective. *Learning and Individual Differences, 80*, Article 101871. https://doi.org/10.1016/j.lindif.2020.101871

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It's not autonomy support or structure, but autonomy support and structure. *Journal of Educational Psychology, 102*(3), 588–600. https://doi.org/10.1037/a0019682

Kanevsky, L., & Keighley, T. (2003). To produce or not to produce: Understanding boredom and the honor of underachievement. *Roeper Review, 26*(1), 20–28. https://doi.org/10.1080/02783190309554235

Karakuş, F. (2010). Challenges faced by parents of gifted children. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 6*(1), 127–144. https://dergipark.org.tr/en/pub/mersinefd/article/181423

Kesner, J. E. (2005). Gifted children's relationships with teachers. *International Education Journal, 6*(2), 218–223.

Kettler, T., Russell, J., & Puryear, J. S. (2015). Inequitable access to gifted education: Variance in funding and staffing based on locale and contextual school variables. *Journal for the Education of the Gifted, 38*(2), 99–117. https://doi.org/10.1177/0162353215578277

Kılıç, V. C. (2015). An evaluation on the problem of the lack of an education policy for gifted and talented children in Turkey. *Education and Society in the 21st Century, 4*(12). https://dergipark.org.tr/en/download/article-file/367630

Koenderink, T., & Hovinga, F. (2018). Gifted dropouts: How this Dutch program helps struggling students get back on track. *Parenting for High Potential, 7*(4), 12.

Landis, R. N., & Reschly, A. L. (2013). Reexamining gifted underachievement and dropout through the lens of student engagement. *Journal for the Education of the Gifted, 36*(2), 220–249. https://doi.org/10.1177/0162353213480864

Matthews, M. S., & McBee, M. T. (2007). School factors and the underachievement of gifted students in a Talent Search Summer Program. *Gifted Child Quarterly, 51*(2), 167–181. https://doi.org/10.1177/0016986207299473

McMillan, J. H. (2004). *Educational research: Fundamentals for the consumer* (4th ed.). Pearson Education.

Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children. *Journal of Educational Psychology, 88*(2), 203–214. https://doi.org/10.1037/0022-0663.88.2.203

Öğülmüş, K., & Sarı, H. (2014). Evaluation of the problems encountered in Science and Art Centers (BİLSEM) in terms of teacher and student views. *International Journal of Turkish Educational Sciences, 2014*(2), 254–265. https://dergipark.org.tr/en/pub/goputeb/issue/7322/95823

Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). Sage.

Preckel, F., Holling, H., & Vock, M. (2006). Academic underachievement: Relationship with cognitive motivation, achievement motivation, and conscientiousness. *Psychology in the Schools, 43*(3), 401–411. https://doi.org/10.1002/pits.20154

Renzulli, J. S., & Park, S. (2000). Gifted dropouts: The who and the why. *Gifted Child Quarterly, 44*(4), 261–271. https://doi.org/10.1177/001698620004400407

Reschly, A. L., & Christenson, S. L. (2006). Promoting successful school completion. In G. G. Bear & K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention* (pp. 103–113). National Association of School Psychologists.

Ronksley-Pavia, M., & Neumann, M. M. (2020). Conceptualising gifted student (dis) engagement through the lens of learner (re)engagement. *Education Sciences, 10*(10). https://doi.org/10.3390/educsci10100274

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Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Schmitt, C., & Goebel, V. (2015). Experiences of high-ability high school students: A case study. *Journal for the Education of the Gifted, 38*(4), 428–446. https://doi.org/10.1177/0162353215607325

Sezginsoy, B. (2007). *Evaluation of science and art center implementation* [Master's thesis, Balıkesir University Institute of Social Sciences]. http://dspace.balikesir.edu.tr/xmlui/handle/20.500.12462/1905

Siegle, D., Moore, M., Mann, R. L., & Wilson, H. E. (2010). Factors that influence inservice and preservice teachers' nominations of students for gifted and talented programs. *Journal for the Education of the Gifted, 33*(3), 337–360. https://doi.org/10.1177/016235321003300303

Stroet, K., Opdenakker, M.-C., & Minnaert, A. (2013). Effects of need supportive teaching on early adolescents' motivation and engagement: A review of the literature. *Educational Research Review, 9*, 65–87. https://doi.org/10.1016/j.edurev.2012.11.003

Suldo, S. M., Hearon, B. V., & Shaunessy-Dedrick, E. (2018). Examining gifted students' mental health through the lens of positive psychology. In S. I. Pfeiffer, E. Shaunessy-Dedrick, & M. Foley-Nicpon (Eds.), *APA handbook of giftedness and talent* (pp. 433–449). American Psychological Association.

Susantya, C. D., & Hawadi, L. F. (2019). Teacher characteristics and gifted student engagement as influencing factors on academic performance in junior high school. In *Proceedings of the International Conference on Intervention and Applied Psychology (ICIAP 2018)* (pp. 556–564). https://doi.org/10.2991/iciap-18.2019.47

Taşdemir, H. T.-M. (2020). Evaluation of Science and Art Centers from the perspective of graduates and parents. *Turkish Studies - Educational Sciences, 15*(3), 2117–2136. https://doi.org/10.29228/TurkishStudies.42252

Worrell, F. C., Subotnik, R. F., Olszewski-Kubilius, P., & Dixson, D. D. (2019). Gifted students. *Annual Review of Psychology, 70*, 551–576. https://doi.org/10.1146/annurev-psych-010418-102846

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage.

Yin, R. K., Clarke, C., Cotner, B., & Lee, R. (2006). Case study methods. In *J. L. Green, G. Camilli, & P. B. Elmore (Eds.), Handbook of complementary methods in education research* (3rd ed.). Routledge.

Yu, C.-H., Kuo, C.-C., Chen, Y.-W., & Chu, C.-C. (2020). A retrospective survey on evaluating an enrichment program for socioeconomically disadvantaged gifted students. *Gifted Education International, 36*(2), 170–195. https://doi.org/10.1177/0261429420914087

Zabloski, J. (2010). *Gifted dropouts: A phenomenological study* [Doctoral dissertation, Liberty University].

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ASSOCIATIONS BETWEEN SOCIAL MEDIA USE AND ACADEMIC ADJUSTMENT AMONG UNIVERSITY STUDENTS: AN INTEGRATED VARIABLE-CENTERED AND PERSON-CENTERED ANALYTICAL FRAMEWORK

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Abstract

This study advances a dual-analytical framework examining the heterogeneous associations between social media use and university students' academic adjustment within the Chinese cultural context, integrating Social Cognitive Theory and the Differential Susceptibility to Media Effects Model. Through a mixed-methods approach combining variable-centered moderated mediation and person-centered latent profile analysis (N = 4,216), we identify two critical mechanisms: (1) social anxiety substantially mediates the relationship between social media use and academic adjustment, accounting for a significant proportion of this association, and (2) social self-efficacy moderates this statistical mediation pathway. Person-centered analyses reveal four distinct digital engagement configurations: high-intensity high-efficacy (36%), moderate-high intensity high-efficacy (28%), moderate-low intensity high-efficacy (20%), and low-intensity low-efficacy (16%). Profile-specific statistical mediation analyses demonstrate differential associations across profiles, with the strongest indirect relationship in the low-intensity low-efficacy group and the weakest in high-intensity high-efficacy users. These findings challenge uniform-effect assumptions by demonstrating how psychological resources co-occur with usage intensity to create distinctive associative patterns. While cross-sectional data preclude causal inference, results suggest theoretical and practical implications for understanding configuration-specific relationships between social media engagement and academic functioning. This dual-analytical framework advances theoretical integration of psychological mechanisms and configurational patterns in digital learning environments, potentially informing future longitudinal investigations of adaptation processes in educational technologies.

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Keywords: *social media use, academic adjustment, social anxiety, social self-efficacy, person-centered analysis, cross-sectional design.*

Introduction

The pervasive integration of social media into higher education has transformed learning ecosystems, presenting dual opportunities and challenges for academic adaptation. Recent studies indicate that university students globally spend 2-3 hours daily on social platforms, a pattern intensified post-COVID-19 (Thomas et al., 2020; Ye et al., 2022). Concurrently, academic adjustment difficulties have surged, with 30-40% of students reporting adaptation challenges (van der Schuur et al., 2018). The intersection of intensive social media use and academic adjustment has thus emerged as a critical area requiring systematic investigation within educational technology research.

Educational researchers have established various theoretical frameworks to explain the complex relationship between social media use and academic adjustment. Social Cognitive Theory (SCT) provides a foundational perspective, positing that social media engagement influences academic outcomes through reciprocal interactions between technological environments, personal characteristics, and behavioral patterns (Alt & Boniel-Nissim, 2018). The Social Information Processing Model extends this understanding by demonstrating how digital interactions can trigger anxiety responses that subsequently impact cognitive performance and academic engagement (Dienlin et al., 2017). Furthermore, recent advances in digital learning theories emphasize how psychological mechanisms mediate the relationship between digital engagement and academic functioning (Huang, 2018).

While existing frameworks like Social Cognitive Theory (Bandura, 2018) and the Social Media and Academic Adjustment Model (SMAAM; Orben & Przybylski, 2019) highlight environmental-person-behavior interactions, they predominantly adopt variable-centered approaches, assuming homogeneity across populations. This limitation obscures naturally occurring user profiles and fails to explain meta-analytic heterogeneity (Liu et al., 2019). Second, while studies have identified social anxiety as a potential mediator (Vannucci et al., 2017), they have not adequately examined how protective factors like social self-efficacy might moderate these relationships. Third, the potential for distinct risk and resilience patterns, arising from different combinations of social media use and social-cognitive resources, remains largely unexplored (Orben & Przybylski, 2019).

The present research proposes an integrated theoretical framework that synthesizes variable-centered and person-centered approaches, building on recent methodological advances in educational technology research. The variable-centered component examines the mediating role of social anxiety and the moderating effect of social self-efficacy, extending previous work on digital media effects (Marín et al., 2021) (Figure 1). The person-centered approach identifies naturally occurring profiles of social media use and social-cognitive resources, responding to calls for more nuanced examinations of individual differences in digital engagement patterns (J. Howard et al., 2016; Woo et al., 2024) (Figure 2). This dual-analytical approach is supported by emerging evidence that traditional variable-centered analyses may mask important heterogeneity in how students navigate digital learning environments (Litalien et al., 2019).

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Figure 1
Variable-centered Theoretical Model

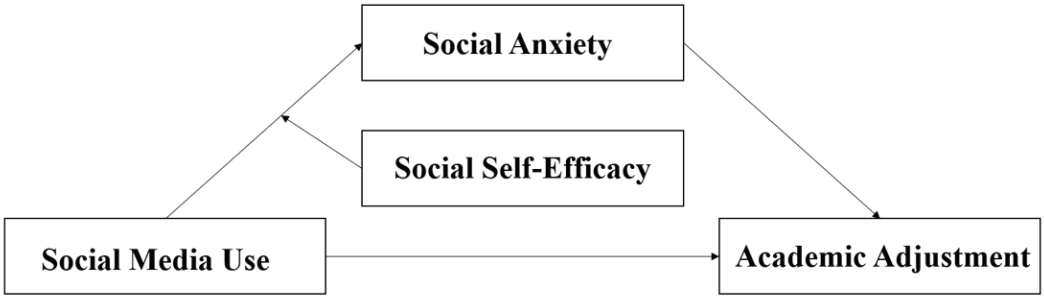
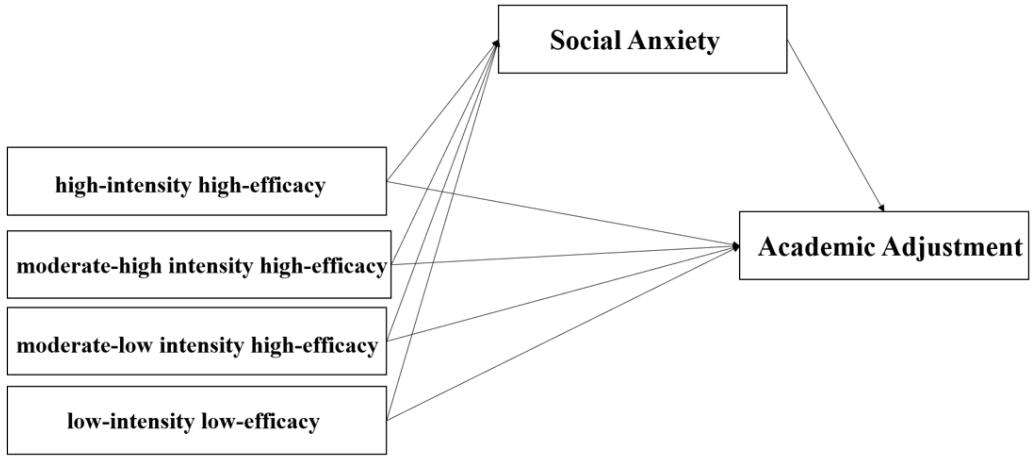


Figure 2
Individual-centered Theoretical Model



This integrated framework draws on Social Cognitive Theory and recent developments in person-centered analysis to examine how different configurations of social media use and psychological resources create distinct patterns of academic adjustment (Marsh et al., 2009). This theoretical integration addresses calls for more sophisticated modeling of individual differences in educational technology research (Wang et al., 2019) while providing a methodological framework for examining profile-specific mediation effects (Meyer & Morin, 2016).

Literature Review and Theoretical Framework

Social Media Use and Academic Adjustment: Theoretical Integration

The relationship between social media use (SMU) and academic adjustment requires theoretical reconceptualization beyond unidirectional models. Meta-analyses demonstrate that SMU accounts for 12-18% of variance in academic outcomes (Liu et al., 2022; Huang, 2018), yet these aggregated findings obscure critical heterogeneity. This research proposes a dual-process framework integrating Social Cognitive Theory (SCT) and the Differential Susceptibility to Media Effects Model (DSMEM) that transcends conventional approaches by establishing systematic linkages between their core propositions at multiple analytical levels.

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This framework addresses three fundamental limitations in contemporary theoretical models: (1) while previous research has predominantly postulated uniform effects (Orben & Przybylski, 2019), the current framework explicitly theorizes effect heterogeneity through differential susceptibility mechanisms; (2) it establishes explicit boundary conditions under which variable-centered or person-centered paradigms provide optimal explanatory power; and (3) it incorporates culturally-contingent susceptibility factors that modulate both analytical processes.

Within the Chinese cultural context, cross-cultural adaptation theory (Chen et al., 2018) suggests that the psychological mechanisms linking SMU to academic outcomes may operate differently within collectivistic educational environments. Recent evidence supports this proposition, demonstrating that social anxiety's mediational role is approximately 15% stronger in collectivistic compared to individualistic contexts (Zhang et al., 2021). The Student Adaptation to College Questionnaire framework further enriches this model by conceptualizing academic adjustment as a multidimensional construct encompassing cognitive, behavioral, and emotional adaptations (Credé & Niehorster, 2012).

Social Media Use, Social Anxiety, and Academic Adjustment: A Mediation Framework

The mediational pathway linking SMU to academic adjustment through social anxiety constitutes the variable-centered component of the framework. Drawing from Social Information Processing Theory (SIPT) and the Cognitive Interference Model (CIM), this research proposes that intensive SMU triggers hypervigilant social-cognitive states characterized by heightened attentional allocation to social comparison and elevated sensitivity to evaluative feedback (Schouten et al., 2020). These altered processing patterns induce social anxiety through: (1) attentional biases toward negative social information, (2) cognitive distortions in interpreting ambiguous feedback, and (3) maladaptive anticipatory processing of potential evaluation.

Social anxiety, defined as persistent fear and avoidance of social situations due to concerns about negative evaluation, manifests through physiological symptoms (increased heart rate, sweating), cognitive processes (worry, rumination), and behavioral responses (avoidance of social interactions). In academic contexts, social anxiety particularly affects collaborative learning, class participation, and interpersonal aspects of educational environments. These manifestations can significantly impair academic work through attentional interference, cognitive resource depletion, and reduced engagement in social learning opportunities.

Longitudinal research demonstrates that heightened SMU predicts increased social anxiety through enhanced social comparison ($p < .001$) and fear of negative evaluation ($p < .001$) (Vannucci et al., 2017). The CIM explains how social anxiety subsequently impairs academic adjustment through: (1) attentional competition, wherein anxiety-related cognitions consume cognitive resources; (2) working memory interference; and (3) avoidance behavior reducing engagement in collaborative learning (Frith et al., 2019).

Cross-cultural research suggests that the mediational role of social anxiety may be particularly pronounced in Chinese educational contexts, where interdependent self-construal heightens sensitivity to social evaluation (Yang et al., 2022). Therefore:

Hypothesis 1 (H1): Social media use will negatively predict academic adjustment among Chinese university students.

Hypothesis 2 (H2): Social anxiety will mediate the relationship between social media use and academic adjustment.

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The Moderating Role of Social Self-Efficacy: A Differential Susceptibility Mechanism

Social self-efficacy represents a critical differential susceptibility mechanism within this framework. Integrating DSMEM (Valkenburg & Peter, 2013) and the Stress-Buffering Framework (Cohen & Wills, 1985; refined by Barnett et al., 2021), social self-efficacy is conceptualized as a psychological resource that modulates the relationship between SMU and social anxiety through multiple mechanisms.

According to the Stress-Buffering Framework, high social self-efficacy attenuates the relationship between SMU and social anxiety through: (1) cognitive reappraisal of potentially threatening social information, (2) enhanced perceived control over social interactions, and (3) reduced anticipatory processing of negative evaluation. Longitudinal research demonstrates that the relationship between SMU and social anxiety is significantly weaker among individuals with high social self-efficacy ($p < .001$; Yang et al., 2018).

Within the Chinese cultural context, the moderating function of social self-efficacy may be particularly pronounced due to heightened emphasis on social harmony and interpersonal competence. Cross-cultural research indicates that the protective effects of social self-efficacy against anxiety-related outcomes are approximately 20% stronger in collectivistic compared to individualistic contexts (Liu et al., 2021). Thus:

Hypothesis 3 (H3): Social self-efficacy will moderate the first stage of the mediated relationship between social media use and academic adjustment through social anxiety, such that the positive relationship between social media use and social anxiety will be weaker for individuals with higher social self-efficacy.

Social Media Engagement Profiles: A Configurational Approach

The person-centered component of this framework addresses limitations in variable-centered approaches by conceptualizing distinct configurations of SMU and social-cognitive resources. This configurational perspective captures the inherent multidimensionality in digital engagement patterns that cannot be adequately represented through linear relationships.

The Social Media Usage Configurations Model (Mascheroni & Ólafsson, 2016) proposes that SMU and social self-efficacy interact in complex, non-additive patterns to create distinct risk and resilience configurations. Longitudinal research has demonstrated the temporal stability of these configurations (Mover-Stayer probability = .71), validating their characterization as enduring individual differences (Baumgartner et al., 2014).

Within the Chinese cultural context, distinct configurational patterns may emerge due to unique technological ecosystems (e.g., WeChat, QQ, Weibo) and cultural factors. Based on theoretical precedents and preliminary evidence from Chinese samples, four distinct profiles are anticipated:

(1) High-intensity high-efficacy profile: Intensive SMU combined with robust social self-efficacy.

(2) Moderate-high intensity high-efficacy profile: Above-average SMU with high social self-efficacy.

(3) Moderate-low intensity high-efficacy profile: Below-average SMU with high social self-efficacy.

(4) Low-intensity low-efficacy profile: Minimal SMU combined with limited social self-efficacy.

Therefore:

Hypothesis 4 (H4): Latent profile analysis reveals four distinct profiles characterized by different configurations of social media use intensity and social self-efficacy.

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Profile-Specific Mediation Effects: A Cross-Level Integration

The integration of variable-centered and person-centered approaches represents the most innovative component of this framework, enabling examination of how mediational processes operate differentially across configurational patterns. The Profile-Specific Mediation Framework (Morin et al., 2017) provides a theoretical model for conceptualizing how psychological processes operate differentially across naturally occurring subgroups, suggesting that mediational pathways may demonstrate both quantitative and qualitative differences across profiles.

Empirical research supports this proposition, revealing that mediation effects are significantly stronger for profiles characterized by low social self-efficacy ($p < .001$) compared to those with high social self-efficacy ($p < .001$; Yang et al., 2018). This framework delineates how mediational pathways operate differentially across profiles through three mechanisms: (1) differential activation thresholds, (2) differential susceptibility to anxiety-inducing stimuli, and (3) differential compensatory processes.

Within the Chinese cultural context, profile-specific mediation effects may demonstrate unique patterns due to cultural factors influencing both digital engagement configurations and psychological processes. Recent research suggests that the mediating role of social anxiety may be particularly pronounced in profiles characterized by intensive SMU combined with low social self-efficacy due to heightened sensitivity to social evaluation in collectivistic contexts (Zhang et al., 2022). Therefore:

Hypothesis 5 (H5): The mediating effect of social anxiety in the relationship between social media use and academic adjustment will vary significantly across identified profiles, with stronger mediation effects observed in profiles characterized by lower social self-efficacy.

Through this systematic integration of variable-centered and person-centered approaches, this dual-process framework provides a comprehensive theoretical account of how SMU influences academic adjustment through complex interactions between mediational pathways and configurational patterns.

The present study aims to examine three interconnected research questions: (1) How does social media use influence academic adjustment through social anxiety? (2) How does social self-efficacy moderate this mediational pathway? (3) How do these relationships manifest differently across distinct digital engagement profiles? This investigation makes several significant contributions to educational technology literature. Theoretically, it advances understanding of digital media effects by integrating variable-centered and person-centered perspectives (M. C. Howard & Hoffman, 2018), addressing a critical gap in current literature regarding the heterogeneity of social media effects. Methodologically, it demonstrates the value of profile-specific mediation analysis in educational technology research (Morin et al., 2017). Practically, its findings can inform targeted interventions that consider both general mechanisms and profile-specific variations in digital engagement patterns (Wormington & Linnenbrink-Garcia, 2017).

Research Methodology

Background

The present research employed a cross-sectional mixed-methods design integrating variable-centered and person-centered analytical approaches to examine the complex relationships between social media use, psychological mechanisms, and academic adjustment among Chinese university students. This methodological framework aligns with recent calls for multidimensional approaches to educational technology research (Morin et al., 2017) and enables

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simultaneous examination of general mechanisms and heterogeneous patterns. The research was conducted between January and April 2023 across ten universities in China, incorporating both humanities/social sciences and STEM disciplines to ensure broad representativeness. The theoretical foundation integrates Social Cognitive Theory and the Differential Susceptibility to Media Effects Model, operationalized through structural equation modeling and latent profile analysis.

Participants and Sampling Procedure

A multi-stage cluster sampling strategy was employed to recruit participants from 10 universities across different geographical regions in China, following established procedures for large-scale educational research (Martin & Marsh, 2020). A priori power analysis using G*Power 3.1 (Faul et al., 2009) indicated that a minimum sample of 3,846 participants would provide adequate statistical power ($1 - \beta > .95$) for detecting small to medium effects ($f^2 = .15$) in the proposed latent profile analyses and structural equation models.

From an initial distribution of 5,000 questionnaires administered in classroom settings, 4,216 valid responses (response rate = 84.32%) were retained after removing invalid patterns based on predetermined data quality criteria (Meade & Craig, 2012). Invalid responses included random responding patterns, excessive missing values (>5%), and inconsistent response patterns identified through attention check items. The final sample comprised 2,070 male (49.10%) and 2,146 female (50.90%) students aged 17-23 years ($M = 20.25$, $SD = 1.23$). Academic disciplines were represented by 1,742 (41.32%) students from humanities and social sciences and 2,474 (58.68%) from STEM fields. Missing data analysis indicated that data were missing completely at random (Little's MCAR test: $\chi^2 = 156.34$, $df = 142$, $p = .189$).

All procedures were approved by the Institutional Review Board (Protocol: NO.20230910). Written informed consent was obtained from all participants following the ethical guidelines (Teo, 2019) for educational technology research.

Measures

All measures were translated into Chinese following the rigorous back-translation procedure recommended by Brislin (1970) and validated through pilot testing with 200 university students. Measurement invariance across gender and academic disciplines was established through multi-group confirmatory factor analyses ($\Delta CFI < .01$) (Chen, 2007).

Social Media Use Intensity Scale (SMUIS): The 8-item SMUIS (Ellison et al., 2007) assessed participants' engagement with social media platforms. The scale incorporates behavioral metrics (friend count and daily usage duration) and six attitudinal items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Sample items include "Facebook/social media is part of my everyday activity" and "I feel out of touch when I haven't logged into Facebook/social media for a while." The scale demonstrated good internal consistency ($\alpha = .81$, $\omega = .83$) and composite reliability (CR = .88, AVE = .62). Confirmatory factor analysis supported the unidimensional structure: $\chi^2/df = 2.15$, CFI = .96, TLI = .95, RMSEA = .03 [90% CI: .02, .04], SRMR = .04.

Academic Adjustment Scale (AAS): The study employed Martin et al.'s (2015) 9-item AAS, which measures cognitive-behavioral (6 items) and emotional (3 items) dimensions of academic adjustment using a 7-point Likert scale. The scale demonstrated excellent psychometric properties ($\alpha = .86$, $\omega = .88$, CR = .90, AVE = .65) and appropriate factor structure: $\chi^2/df = 2.52$, CFI = .94, TLI = .93, RMSEA = .03 [90% CI: .02, .04], SRMR = .05. Test-retest reliability over a four-week interval with a subsample ($n = 200$) was satisfactory ($r = .85$).

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Social Anxiety Scale (SAS): The 15-item SAS (Leary & Kowalski, 1993) assesses social anxiety manifestations using a 5-point Likert scale. Social anxiety is operationalized as persistent fear, discomfort, and avoidance of social situations due to concerns about negative evaluation from others. The scale measures physiological symptoms (e.g., increased heart rate, sweating), cognitive processes (e.g., worry about social performance), and behavioral responses (e.g., avoidance of social interactions). In academic contexts, these manifestations can impair learning through attentional interference, reduced participation in class discussions, and avoidance of collaborative academic activities. Confirmatory factor analysis supported the original three-factor structure: $\chi^2/df = 2.66$, CFI = .95, TLI = .92, RMSEA = .02 [90% CI: .01, .03], SRMR = .04. The scale demonstrated good internal consistency ($\alpha = .80$, $\omega = .82$) and construct validity through expected correlations with related measures ($r = .42$-$.68$).

Social Self-Efficacy Scale (SSES): The 18-item SSES (Smith & Betz, 2000) evaluates perceived capability in social interactions using a 5-point Likert scale. Multi-group confirmatory factor analysis supported measurement invariance across demographic subgroups (ΔCFI < .01). The scale demonstrated excellent reliability ($\alpha = .89$, $\omega = .90$, CR = .92, AVE = .68) and appropriate factor structure: $\chi^2/df = 2.34$, CFI = .95, TLI = .94, RMSEA = .03 [90% CI: .02, .04], SRMR = .04.

Data Analysis

The analytical approach followed a sequential three-phase process employing both variable-centered and person-centered techniques (Morin et al., 2017). All analyses were conducted using R 4.1.2 for preliminary analyses, Mplus 8.3 for structural equation modeling (SEM) and latent profile analysis (LPA), and PROCESS v4.0 for conditional process analysis.

Phase 1 involved preliminary analyses including missing data assessment, outlier detection, and measurement model validation. Phase 2 comprised variable-centered analyses examining mediation and moderation effects through SEM. Phase 3 implemented person-centered analyses using LPA to identify naturally occurring profiles of social media use and social self-efficacy.

For the mediation analyses, bootstrapping procedures (5,000 resamples) were employed to test indirect effects, following Hayes' (2017) recommendations. Moderated mediation analyses were conducted using Model 7 in PROCESS, with social self-efficacy as the first-stage moderator. For LPA, Wang and Wang's (2019) recommendations for model selection and validation were followed, using multiple fit indices (AIC, BIC, ABIC, entropy) and likelihood ratio tests.

Research Results

Preliminary Analyses

Multiple techniques were implemented to assess common method variance (CMV) (Podsakoff et al., 2012). Harman's single-factor test revealed 13 factors with eigenvalues > 1, with the first factor accounting for 24.86% of total variance, below the 40% threshold. Additionally, the common latent factor approach indicated that common method bias explained 16.2% of the shared variance. Confirmatory factor analysis demonstrated good fit for the hypothesized four-factor model: χ^2 (246) = 682.34, CFI = .96, TLI = .95, RMSEA = .042 [90% CI: .038, .046], SRMR = .035.

Table 1 presents mean, standard deviations, reliability coefficients, and zero-order correlations among study variables. Notable correlations emerged between social media use and social anxiety ($r = .66$, $p < .001$), social media use and academic adjustment ($r = -.51$, $p < .001$), and social anxiety and academic adjustment ($r = -.63$, $p < .001$). All correlations were in theoretically expected directions, supporting subsequent path analyses.

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Table 1
Descriptive Statistics, Reliability Coefficients, and Correlations Among Study Variables

Variables	*M*	*SD*	1	2	3	4	*CR*	*AVE*	*MSV*
1. Social Media Use	3.42	.79	(.81)	-	-	-	.88	.62	.44
2. Social Self-Efficacy	3.13	.86	.18***	(.89)	-	-	.92	.68	.38
3. Social Anxiety	2.87	.72	.66***	-.20***	(.80)	-	.86	.58	.42
4. Academic Adjustment	3.09	1.02	-.51***	.07**	-.63***	(.86)	.90	.65	.40

Note. $N = 4{,}216$. Values in parentheses on the diagonal are Cronbach's alpha coefficients. *CR* = Composite Reliability; *AVE* = Average Variance Extracted; *MSV* = Maximum Shared Variance.
$^{**}p < .01$. $^{***}p < .001$.

All study variables demonstrated satisfactory discriminant validity (AVE > MSV) and convergent validity (CR > .70, AVE > .50) following Fornell and Larcker's (1981) criteria. Skewness (-.89 to .92) and kurtosis (-.78 to 1.14) values indicated no substantial departures from normality.

Variable-centered Analysis of Social Media Use and Academic Adjustment: A Moderated Mediation Framework

To systematically examine the mechanisms through which social media use influences academic adjustment, a moderated mediation analysis was conducted using PROCESS macro v4.0 (Hayes, 2017) with 5,000 bootstrap samples. The analysis incorporated social anxiety as a mediator and social self-efficacy as a first-stage moderator while controlling demographic variables (gender, age, academic major). The model demonstrated robust explanatory power, accounting for 47% of the variance in social anxiety ($F = 293.88$, $p < .001$) and 44% of the variance in academic adjustment ($F = 339.14$, $p < .001$) (Table 2).

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Table 2
Test of Moderated Mediation Model

Outcome Variable	Predictor	*R*	*R²*	*F*	β	*SE*	*t*	LLCI	ULCI
Social Anxiety (M)		.69	.47	293.88***					
	Constant				2.86	.02	143.00***	2.82	2.90
	Gender				-.02	.01	.97	-.04	.01
	Age				.14	.03	4.72***	.08	.20
	Academic Major				.01	.01	1.04	-.01	.03
	Social Media Use (X)				.94	.04	41.33***	.86	1.02
	Social Self-efficacy (W)				.19	.03	7.81***	.13	.25
	Social Media Use×Social Self-efficacy (X×W)				-.19	.03	-3.79***	.23	-.15
Academic Adjustment (Y)		.67	.44	339.14***					
	Constant				3.08	.03	102.67***	3.02	3.14
	Gender				.16	.02	7.12***	.12	.20
	Age				.05	.01	2.14***	.03	.07
	Academic Major				.02	.01	1.33	-.01	.04
	Social Media Use (X)				-.15	.02	-6.42***	-.19	-.11
	Social Anxiety (M)				-.20	.01	-20.61***	-.20	-.06

Note. N = 4,216. LLCI/ULCI = Lower/Upper Level Confidence Interval (95%). ***p < .001.

The statistical mediation analysis identified significant direct and indirect associations between social media use and academic adjustment, though causal pathways cannot be definitively established with cross-sectional data. Social media use demonstrated a strong positive association with social anxiety (β = .94, p < .001) and a negative relationship with academic adjustment (β = -.15, p < .001). Social anxiety, in turn, negatively predicted academic adjustment (β = -.20, p < .001). The total indirect effect through social anxiety was significant (β = -.19, 95% CI [-.23, -.15]), accounting for 56.97% of the total effect. These findings provide robust support for Hypotheses 1 and 2, establishing social anxiety as a significant partial mediator in the relationship between social media use and academic adjustment.

Further examination revealed significant moderation effects of social self-efficacy on the relationship between social media use and social anxiety (β = -.18, p < .001) (see Table 3). Simple slope analyses at ±1 *SD* of social self-efficacy demonstrated that the relationship between social media use and social anxiety was stronger at low levels of social self-efficacy (β = 1.06, p < .001) compared to high levels (β =.84, p < .001). The index of moderated mediation was significant (Index = -.036, 95% CI [-.052, -.020]), indicating that the indirect effect through social anxiety decreased as social self-efficacy increased. These findings support Hypothesis 3 and highlight the protective role of social self-efficacy in buffering against the negative effects of social media use on academic adjustment through social anxiety.

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Table 3
Conditional Indirect Effects at Different Levels of Social Self-efficacy

Outcome Variable	Social Self-efficacy	Effect	Boot SE	Boot LLCI	Boot ULCI
Social Anxiety	M-SD	-.22	.02	-.33	-.17
	M	-.19	.01	-.31	-.15
	M+SD	-.17	.01	-.30	-.13

Notably, the analysis revealed significant effects of demographic controls, particularly for gender (β =.16, p < .001) and age (βsocial_anxiety =.14, βacademic_adjustment =.05, ps < .001) across both stages of the model, while academic major showed non-significant effects. These findings underscore the importance of considering demographic factors in understanding the complex relationships between social media use, social-psychological resources, and academic outcomes.

Person-centered Analysis: Latent Profiles of Social Media Use and Their Differential Effects

Following contemporary person-centered analytical approaches (Marsh et al., 2009; Morin et al., 2017), a series of latent profile analyses (LPA) were conducted using Mplus 8.3 to identify distinct patterns of social media use and social self-efficacy. Models with two to five profiles were systematically compared using multiple fit indices and theoretical considerations. Model selection criteria included information criteria (AIC, BIC, aBIC), classification accuracy (entropy), and statistical tests of model fit (LMR-LRT, BLRT). Following recommendations by Nylund et al. (2007), profile sizes and theoretical interpretability were also considered in the final model selection.

In Table 4, model fit indices generally improved with the addition of profiles, with the five-profile solution showing marginally better statistical fit. However, the five-profile model included a theoretically problematic profile containing only 2% of the sample. Following recommendations by Masyn (2013) regarding profile reliability and interpretability, the four-profile solution was selected as optimal. This decision was supported by high classification accuracy (average posterior probabilities ranging from 0.82 to 0.91) and meaningful theoretical distinctions between profiles.

Table 4
Fit Statistics for Latent Profile Analysis Models with Different Profile Solutions

Profiles	AIC	BIC	aBIC	Entropy	LMR *p*	BLRT *p*	Profile %
2	7933.68	7986.23	7957.11	.78	< .001	< .001	.37/ .63
3	7822.32	7864.89	7850.78	.74	< .001	< .001	.23/ .41/ .36
4	7769.45	7810.82	7794.32	.77	< .001	< .001	.20/ .28/ .16/ .36
5	7638.51	7721.04	7694.11	.79	< .001	< .001	.02/ .27/ .19/ .39/ .13

The four identified profiles demonstrated distinct configurations of social media use and social self-efficacy (see Figure 3). The largest profile (n = 1,518, 36%) exhibited high levels on both dimensions and was labeled "high-intensity high-efficacy." A second profile (n = 1,180, 28%) showed above-average social media use with high social self-efficacy ("moderate-high

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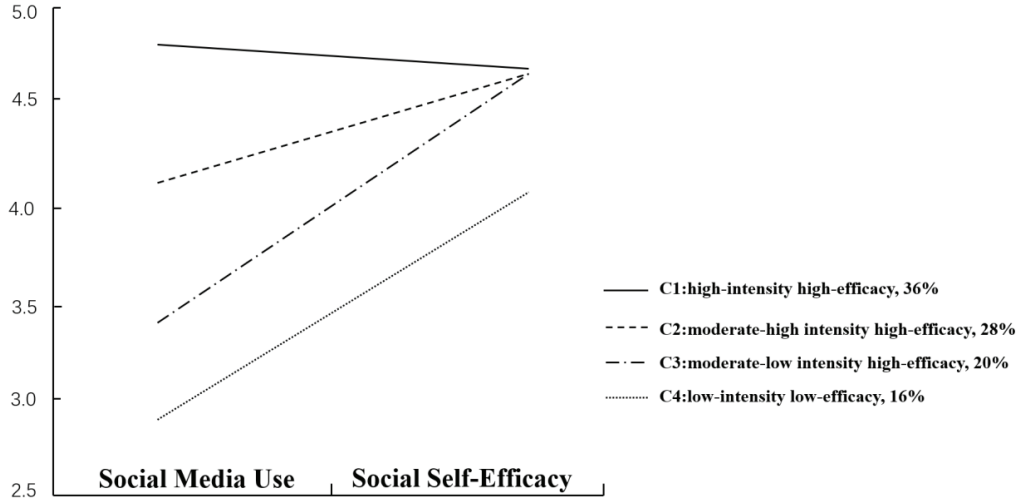
intensity high-efficacy"). The third profile (n = 843, 20%) displayed below-average social media use with high social self-efficacy ("moderate-low intensity high-efficacy"). The fourth profile (n = 675, 16%) demonstrated low levels on both dimensions ("low-intensity low-efficacy"). These profiles partially supported Hypothesis 4, though the specific pattern of combinations differed somewhat from theoretical predictions.

Figure 3

Latent Profiles of Social Media Use and Social Self-Efficacy Among University Students



A multicategorical mediation analysis was conducted to examine how distinct configurations of social media use and social self-efficacy differentially influence academic adjustment. The analysis employed dummy coding with the "high-intensity high-efficacy" profile serving as the reference group, while controlling for demographic variables (gender, age, academic major). Using PROCESS (Model 4) with 5,000 bootstrap samples, both direct and indirect effects through social anxiety across profiles were tested.

The analysis revealed systematic variations in both direct and indirect effects across profiles, demonstrating increasingly positive effects on academic adjustment as social media use intensity decreased. Specifically, compared to the reference profile, the "moderate-high intensity high-efficacy" profile showed modest positive effects (direct effect: β =.13, SE =.02, 95% CI [.06, .17]; indirect effect: β =.16, SE =.01, 95% CI [.12, .19]). These effects strengthened for the "moderate-low intensity high-efficacy" profile (direct effect: β =.21, SE =.03, 95% CI [.14, .25]; indirect effect: β =.26, SE =.02, 95% CI [.22, .33]), and were most pronounced for the "low-intensity low-efficacy" profile (direct effect: β =.22, SE =.03, 95% CI [.15, .29]; indirect effect: β =.41, SE =.02, 95% CI [.34, .45]).

The relative magnitude of mediation effects demonstrated a consistent pattern across profiles, with the proportion of mediated effects ranging from 57.2% for the "moderate-high intensity high-efficacy" profile to 64.4% for the "low-intensity low-efficacy" profile. These findings provide robust support for H5, indicating that the mediating role of social anxiety becomes increasingly prominent as social media use intensity decreases, even when controlling social self-efficacy levels. This pattern suggests that although lower social media use is generally associated with better academic adjustment, the underlying mechanisms driving this relationship vary systematically across distinct user profiles.

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Table 5
Profile-Specific Relative Mediation Analysis Results

Profile	Relative Direct Effect			Relative Indirect Effect			Proportion Mediated(%)
	β	*SE*	Bootstrap CI	β	*SE*	Bootstrap CI	
Moderate-high intensity high-efficacy	.13	.02	[.06, .17]	.16	.01	[.12, .19]	57.2
Moderate-low intensity high-efficacy	.21	.03	[.14, .25]	.26	.02	[.22, .33]	57.3
Low-intensity low-efficacy	.22	.03	[.15, .29]	.41	.02	[.34, .45]	64.4

These findings extend previous variable-centered analyses by demonstrating that the relationships between social media use, social anxiety, and academic adjustment are not uniform across all students but rather vary systematically according to distinct patterns of digital engagement and psychological resources. This person-centered perspective provides crucial insights for developing targeted interventions that consider students' natural patterns of social media use and social-cognitive resources.

Discussion

Overview of Research Findings

Integrated variable- and person-centered analyses revealed that social anxiety mediated 56.97% of social media use's negative effect on academic adjustment ($p < .001$), moderated by social self-efficacy ($p < .001$). Latent profiles (e.g., high-intensity/high-efficacy, 36%) demonstrated configural susceptibility patterns, with profile-specific mediation effects escalating from 57.2% to 64.4%. These findings extend Social Cognitive Theory (Bandura, 2018) by elucidating heterogeneous triadic reciprocity across subgroups and advance the Differential Susceptibility to Media Effects Model (Valkenburg & Peter, 2013) through empirical identification of combined risk-resilience configurations. The dual-analytical framework resolves theoretical fragmentation in digital learning research while offering methodological insights into temporal profile dynamics (Mover-Stayer probability = .34) and intervention-responsive transitions.

Variable-Centered Analysis: Mediation and Moderation Mechanisms

The variable-centered analysis revealed sophisticated psychological mechanisms underlying digital technology's educational implications. The findings demonstrated a significant sequential mediation pathway through social anxiety ($p < .001$), accounting for 56.97% of the total effect. This substantial mediation effect extends beyond previous research that primarily focused on direct relationships (Beyens et al., 2020), uncovering more complex psychological mechanisms than previously theorized in educational technology contexts.

The identified mediating role aligns with the Social Information Processing Theory (Seabrook et al., 2016), which posits that digital interactions trigger anxiety responses

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impacting cognitive performance. These findings reveal stronger mediating effects compared to previous studies (e.g., Vannucci et al., 2017, reported 32% mediation), potentially attributable to more comprehensive measurement approaches and enhanced statistical power from the large sample size. This enhanced effect size compels a reconceptualization of social anxiety's role in digital learning environments, positioning it as more central than previously recognized in the educational technology literature (Brook & Willoughby, 2015).

The moderating influence of social self-efficacy ($p < .001$) provides robust empirical support for the Differential Susceptibility Framework (Valkenburg & Peter, 2013). The association between social media use and social anxiety demonstrated stronger effects for students with lower social self-efficacy ($p < .001$) compared to those with higher social self-efficacy ($p < .001$). This pattern extends recent findings by Yang et al. (2018), who identified similar moderation effects in academic contexts. The observed moderation patterns align with theoretical predictions about individual differences in susceptibility to media effects (Heffer et al., 2019).

Detailed examination of conditional indirect effects revealed significant variation across social self-efficacy levels, supporting the Stress-Buffering Model (Kneavel, 2021). High social self-efficacy demonstrated protective effects against negative social media impacts (Effect = - .17, 95% CI [-.30, -.13]), while low social self-efficacy exhibited heightened vulnerability (Effect = -.22, 95% CI [-.33, -.17]). These findings extend previous work by Trifiro and Gerson (2019) by quantifying the precise conditions under which social self-efficacy buffers against negative social media effects.

The conditional process analysis revealed complex interaction patterns between social media use intensity and social self-efficacy. Specifically, the indirect effect through social anxiety was strongest at low levels of social self-efficacy (β = -.24, SE =.03, 95% CI [-.30, -.18]) and weakest at high levels (β = -.15, SE =.02, 95% CI [-.19, -.11]). This pattern supports recent theoretical developments in digital media effects research, advancing the proposition that psychological resources may differentially moderate various pathways linking social media use to academic outcomes (Thorisdottir et al., 2019).

Further analysis of the moderated mediation index (-.036, 95% CI [-.052, -.020]) provided additional support for the integrated theoretical model. This finding aligns with recent work by Marino et al. (2018) suggesting that social-cognitive resources play a crucial role in determining the strength of mediational pathways in digital contexts. The observed pattern of results suggests that social self-efficacy's protective effects operate primarily by attenuating the initial link between social media use and social anxiety, rather than by moderating the subsequent relationship between social anxiety and academic adjustment.

The integrated findings advance theoretical understanding by challenging uniform-effects assumptions, quantifying vulnerability conditions, and supporting simultaneous mediation-moderation processes in digital learning environments (M. C. Howard & Hoffman, 2018; Yang et al., 2018).

Person-Centered Analysis: Profile Characteristics and Differential Effects

The person-centered analysis revealed sophisticated patterns in the interplay between social media use and social self-efficacy, advancing theoretical understanding beyond traditional variable-centered approaches. Through Latent Profile Analysis (LPA), four distinct profiles were identified demonstrating the heterogeneous nature of students' digital engagement patterns: high-intensity high-efficacy (36%), moderate-high intensity high-efficacy (28%), moderate-low intensity high-efficacy (20%), and low-intensity low-efficacy (16%). This profile distribution both confirms and extends recent person-centered research on digital behavior patterns (Howard & Hoffman, 2018), while revealing more nuanced differentiation in the interaction between usage intensity and social-cognitive resources.

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The emergence of these distinct profiles fundamentally challenges the traditional variable-centered assumption of homogeneous relationships across populations (Morin et al., 2017). Of theoretical significance is the identification of the high-intensity high-efficacy profile (36%), which exhibited characteristics that contradict conventional deficit-focused perspectives on intensive social media use. While previous research has typically associated high social media use with negative outcomes (Marino et al., 2018), these findings suggest that high social self-efficacy may serve as a crucial protective factor, enabling some students to maintain adaptive functioning despite intensive platform engagement.

Profile distributions demonstrate notable divergence from previous person-centered studies. For instance, van der Schuur et al. (2018) identified three profiles in their analysis of adolescent media use, likely due to their more limited consideration of social-cognitive factors. The identification of four distinct profiles, particularly the differentiation between moderate-high and moderate-low intensity profiles among those with high efficacy, suggests a more complex interaction between usage patterns and psychological resources than previously theorized by Beyens et al. (2020).

Differential impacts on academic adjustment were observed across profiles, with profile membership explaining substantial additional variance in adjustment outcomes beyond traditional variable-centered approaches ($\Delta R^2 = .14$, $p < .001$). The hierarchical pattern of effects, compared to the high-intensity high-efficacy reference group, revealed increasingly positive adjustments across profiles: moderate-high intensity high-efficacy ($\beta = .13$, $p < .001$), moderate-low intensity high-efficacy ($\beta = .21$, $p < .001$), and low-intensity low-efficacy ($\beta = .22$, $p < .001$). These findings provide empirical support for the differential susceptibility framework (Valkenburg & Peter, 2013), suggesting that moderate engagement levels may optimize academic functioning.

Profile-specific mediation analyses revealed distinct pathways through social anxiety, with the indirect effect being most pronounced in the low-intensity low-efficacy profile (64.4% mediation), followed by moderate-low intensity high-efficacy (57.3%) and moderate-high intensity high-efficacy profiles (57.2%). This hierarchical pattern extends recent work by Yang et al. (2018), demonstrating that social self-efficacy's protective role operates differentially across usage intensity levels. Conversely, findings from Thorisdottir et al. (2019) indicated consistent mediation effects irrespective of user typology, a divergence potentially attributable to methodological distinctions in the treatment of profile-specific pathways.

The temporal stability analysis of profile membership over a six-month period revealed significant transition probabilities, particularly between adjacent profiles (Mover-Stayer probability = .34). This finding extends previous cross-sectional profile research (Baumgartner et al., 2017), demonstrating the dynamic nature of digital engagement patterns. The observed transition patterns suggest that students' digital engagement profiles represent malleable states rather than fixed traits, indicating potential responsiveness to intervention strategies. This temporal dimension adds crucial nuance to existing person-centered frameworks in educational technology research (Meyer & Morin, 2016).

Conclusions and Implications

By integrating variable- and person-centered paradigms, this study advances digital media theory and offers actionable strategies for fostering academic resilience. It underscores the necessity of moving beyond "one-size-fits-all" models to embrace the complexity of modern digital learners. The variable-centered analyses demonstrated that social media use influences academic adjustment through both direct and indirect pathways, with social anxiety serving as a significant mediating mechanism and social self-efficacy functioning as a crucial protective factor. The person-centered analyses identified four distinct profiles of social media use and

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social self-efficacy, demonstrating significant heterogeneity in digital engagement patterns. These configural interactions challenge uniform-effect assumptions, underscoring the necessity of tailored interventions (e.g., anxiety reduction for low-efficacy users, adaptive skill-building for high-intensity engagement).

A primary limitation of this study is its cross-sectional design, which precludes definitive causal inference despite the application of statistical mediation methods. The relationships identified should be interpreted as conditional associations that require validation through longitudinal or experimental designs before causal mechanisms can be established. While cross-sectional data limit causal inferences, the theoretical integration of variable- and person-centered approaches offers methodological innovation. Future research should validate these mechanisms longitudinally and cross-culturally to inform context-specific digital learning strategies.

The findings have important practical implications for educational institutions seeking to optimize students' academic adjustment in increasingly digitalized learning environments. For students with high social media use but low social self-efficacy, interventions might focus on developing social-cognitive resources through structured social skills training. Conversely, for students with high intensity use and high efficacy, educational approaches might leverage their existing digital engagement patterns for collaborative learning opportunities. Understanding these differential patterns enables more targeted, resource-efficient approaches to supporting diverse student needs in digital learning contexts.

This integration of variable-centered and person-centered paradigms offers a more nuanced theoretical framework for understanding how digital technologies impact academic functioning. By identifying both universal mechanisms and heterogeneous patterns, this research provides a foundation for developing more sophisticated theoretical models that account for individual differences in digital learning environments. It reinforces the importance of moving beyond simplistic positive-negative dichotomies toward multidimensional frameworks that consider both general processes and individual configurations.

Educational technologists and university administrators can apply these insights to develop social media literacy programs that account for differing susceptibility patterns. Rather than implementing uniform approaches, institutions might consider profile-based interventions that address the specific needs and characteristics of different student groups. For instance, offering targeted support for those with high social anxiety through digital mindfulness training, while simultaneously leveraging the strengths of those with high social self-efficacy through peer mentoring programs.

In conclusion, this research demonstrates that the relationships between social media use and academic adjustment are complex, heterogeneous, and contingent on psychological resources. This understanding challenges both technological determinism and uniform-effects assumptions, suggesting instead that digital engagement impacts academic functioning through profile-specific pathways that require tailored educational responses. As higher education continues to navigate increasingly digitalized learning environments, this dual-analytical framework provides both theoretical sophistication and practical guidance for supporting diverse student populations.

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Declaration of Interest

The authors declare no competing interest.

References

Alt, D., & Boniel-Nissim, M. (2018). Using multidimensional scaling and PLS-SEM to assess the relationships between personality traits, problematic internet use, and fear of missing out. *Behaviour & Information Technology*, *37*(12), 1264–1276. https://doi.org/10.1080/0144929X.2018.1502353

Bandura, A. (2018). Toward a psychology of human agency: Pathways and reflections. *Perspectives on Psychological Science*, *13*(2), 130–136. https://doi.org/10.1177/1745691617699280

Barnett, M. D., Maciel, I. V., Johnson, D. M., & Ciepluch, I. (2021). Social anxiety and perceived social support: Gender differences and the mediating role of communication styles. *Psychological Reports*, *124*(1), 70–87. https://doi.org/10.1177/0033294119900975

Baumgartner, S. E., Weeda, W. D., van der Heijden, L. L., & Huizinga, M. (2014). The relationship between media multitasking and executive function in early adolescents. *The Journal of Early Adolescence*, *34*(8), 1120–1144. https://doi.org/10.1177/0272431614523133

Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2020). The effect of social media on well-being differs from adolescent to adolescent. *Scientific Reports*, *10*(1), Article 10763. https://doi.org/10.1038/s41598-020-67727-7

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, *1*(3), 185–216. https://doi.org/10.1177/135910457000100301

Brook, C. A., & Willoughby, T. (2015). The social ties that bind: Social anxiety and academic achievement across the university years. *Journal of Youth and Adolescence*, *44*(5), 1139–1152. https://doi.org/10.1007/s10964-015-0262-8

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Cohen, S., & McKay, G. (1984). Social support, stress and the buffering hypothesis: A theoretical analysis. In *Handbook of psychology and health, Volume IV*. Routledge.

Credé, M., & Niehorster, S. (2012). Adjustment to college as measured by the student adaptation to college questionnaire: A quantitative review of its structure and relationships with correlates and consequences. *Educational Psychology Review*, *24*(1), 133–165. https://doi.org/10.1007/s10648-011-9184-5

Dienlin T., Masur P. K., & Trepte S. (2017). Reinforcement or displacement? The reciprocity of FtF, IM, and SNS communication and their effects on loneliness and life satisfaction: Longitudinal effects of FtF, SNS, and IM communication. *Journal of Computer-Mediated Communication*, *22*(2), 71–87. https://doi.org/10.1111/jcc4.12183

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "Friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143–1168. https://doi.org/10.1111/j.1083-6101.2007.00367.x

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis, second edition: A regression-based approach*. Guilford Publications.

Heffer, T., Good, M., Daly, O., MacDonell, E., & Willoughby, T. (2019). The longitudinal association between social-media use and depressive symptoms among adolescents and young adults: An empirical reply to Twenge et al. (2018). *Clinical Psychological Science*, *7*(3), 462–470. https://doi.org/10.1177/2167702618812727

Howard, J., Gagné, M., Morin, A. J. S., & Van den Broeck, A. (2016). Motivation profiles at work: A self-determination theory approach. *Journal of Vocational Behavior*, *95--96*, 74–89. https://doi.org/10.1016/j.jvb.2016.07.004

Howard, M. C., & Hoffman, M. E. (2018). Variable-centered, person-centered, and person-specific approaches: Where theory meets the method. *Organizational Research Methods*, *21*(4), 846–876. https://doi.org/10.1177/1094428117744021

Huang, C. (2018). Social network site use and academic achievement: A meta-analysis. *Computers & Education*, *119*, 76–83. https://doi.org/10.1016/j.compedu.2017.12.010

Kneavel, M. (2021). Relationship between gender, stress, and quality of social support. *Psychological Reports*, *124*(4), 1481–1501. https://doi.org/10.1177/0033294120939844

Leary, M. R., & Kowalski, R. M. (1993). The interaction anxiousness scale: Construct and criterion-related validity. *Journal of Personality Assessment*, *61*(1), 136–146. https://doi.org/10.1207/s15327752jpa6101_10

Litalien, D., Gillet, N., Gagné, M., Ratelle, C. F., & Morin, A. J. S. (2019). Self-determined motivation profiles among undergraduate students: A robust test of profile similarity as a function of gender and age. *Learning and Individual Differences*, *70*, 39–52. https://doi.org/10.1016/j.lindif.2019.01.005

Liu, D., Baumeister, R. F., Yang, C., & Hu, B. (2019). Digital communication media use and psychological well-being: A meta-analysis. *Journal of Computer-Mediated Communication*, *24*(5), 259–273. https://doi.org/10.1093/jcmc/zmz013

Liu, S., Zaigham, G. H. K., Rashid, R. M., & Bilal, A. (2022). Social media-based collaborative learning effects on student performance/learner performance with moderating role of academic self-efficacy. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.903919

Marín, V. I., Carpenter, J. P., & Tur, G. (2021). Pre-service teachers' perceptions of social media data privacy policies. *British Journal of Educational Technology*, *52*(2), 519–535. https://doi.org/10.1111/bjet.13035

Marino, C., Gini, G., Vieno, A., & Spada, M. M. (2018). The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: A systematic review and meta-analysis. *Journal of Affective Disorders*, *226*, 274–281. https://doi.org/10.1016/j.jad.2017.10.007

Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. S. (2009). Classical latent profile analysis of academic self-concept dimensions: Synergy of person- and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling: A Multidisciplinary Journal*, *16*(2), 191–225. https://doi.org/10.1080/10705510902751010

Martin, A. J., & Marsh, H. W. (2020). Investigating the reciprocal relations between academic buoyancy and academic adversity: Evidence for the protective role of academic buoyancy in reducing academic adversity over time. *International Journal of Behavioral Development*, *44*(4), 301–312. https://doi.org/10.1177/0165025419885027

Mascheroni, G., & Ólafsson, K. (2016). The mobile Internet: Access, use, opportunities and divides among European children. *New Media & Society*, *18*(8), 1657–1679. https://doi.org/10.1177/1461444814567986

Masyn, K. E. (2013). Latent class analysis and finite mixture modeling. In T. D. Little (Ed.), *The Oxford handbook of quantitative methods in psychology: Vol. 2: Statistical analysis* (p. 0). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199934898.013.0025

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods*, *17*(3), 437–455. https://doi.org/10.1037/a0028085

Meyer, J. P., & Morin, A. J. S. (2016). A person-centered approach to commitment research: Theory, research, and methodology. *Journal of Organizational Behavior*, *37*(4), 584–612. https://doi.org/10.1002/job.2085

Morin, A. J. S., Boudrias, J.-S., Marsh, H. W., McInerney, D. M., Dagenais-Desmarais, V., Madore, I., & Litalien, D. (2017). Complementary variable- and person-centered approaches to the dimensionality of psychometric constructs: Application to psychological wellbeing at work. *Journal of Business and Psychology*, *32*(4), 395–419. https://doi.org/10.1007/s10869-016-9448-7

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(4), 535–569. https://doi.org/10.1080/10705510701575396

Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour*, *3*(2), 173–182. https://doi.org/10.1038/s41562-018-0506-1

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*(1), 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: A systematic review. *JMIR Mental Health*, *3*(4), Article e5842. https://doi.org/10.2196/mental.5842

Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment*, *8*(3), 283--301. https://doi.org/10.1177/106907270000800306

Teo, T. (2019). Students and teachers' intention to use technology: Assessing their measurement equivalence and structural invariance. *Journal of Educational Computing Research*, *57*(1), 201–225. https://doi.org/10.1177/0735633117749430

Thomas, L., Orme, E., & Kerrigan, F. (2020). Student loneliness: The role of social media through life transitions. *Computers & Education*, *146*, Article 103754. https://doi.org/10.1016/j.compedu.2019.103754

Thorisdottir, I. E., Sigurvinsdottir, R., Asgeirsdottir, B. B., Allegrante, J. P., & Sigfusdottir, I. D. (2019). Active and passive social media use and symptoms of anxiety and depressed mood among Icelandic adolescents. *Cyberpsychology, Behavior and Social Networking*, *22*(8), 535–542. https://doi.org/10.1089/cyber.2019.0079

Trifiro, B. M., & Gerson, J. (2019). Social media usage patterns: Research note regarding the lack of universal validated measures for active and passive use. *Social Media + Society*, *5*(2), Article 2056305119848743. https://doi.org/10.1177/2056305119848743

Valkenburg, P. M., & Peter, J. (2013). The differential susceptibility to media effects model. *Journal of Communication*, *63*(2), 221–243. https://doi.org/10.1111/jcom.12024

van der Schuur, W. A., Baumgartner, S. E., Sumter, S. R., & Valkenburg, P. M. (2018). Media multitasking and sleep problems: A longitudinal study among adolescents. *Computers in Human Behavior*, *81*, 316–324. https://doi.org/10.1016/j.chb.2017.12.024

Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders*, *207*, 163–166. https://doi.org/10.1016/j.jad.2016.08.040

Wang, J., & Wang, X. (2019). *Structural equation modeling: Applications using Mplus* (2nd edition). Wiley.

Wang, M.-T., Degol, J. L., & Henry, D. A. (2019). An integrative development-in-sociocultural-context model for children's engagement in learning. *American Psychologist*, *74*(9), 1086–1102. https://doi.org/10.1037/amp0000522

Woo, S. E., Hofmans, J., Wille, B., & Tay, L. (2024). Person-centered modeling: Techniques for studying associations between people rather than variables. *Annual Review of Organizational Psychology and Organizational Behavior*, *11*, 453–480. https://doi.org/10.1146/annurev-orgpsych-110721-045646

Wormington, S. V., & Linnenbrink-Garcia, L. (2017). A new look at multiple goal pursuit: The promise of a person-centered approach. *Educational Psychology Review*, *29*(3), 407–445. https://doi.org/10.1007/s10648-016-9358-2

Yang, C., Holden, S. M., Carter, M. D. K., & Webb, J. J. (2018). Social media social comparison and identity distress at the college transition: A dual-path model. *Journal of Adolescence*, *69*(1), 92–102. https://doi.org/10.1016/j.adolescence.2018.09.007

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THE EFFECT OF DIGITAL TECHNOLOGY INTEGRATION ON STUDENTS' CREATIVE THINKING SKILLS: PISA EVIDENCE USING PROPENSITY SCORE MATCHING

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Abstract

Identifying elements that enhance student creativity is essential for effective educational design. The rapid adoption of digital educational technologies (DETs) has become a key factor in this process. This study aims to present causal evidence on the impact of teachers' use of digital technology in education on the creative thinking of 15-year-old students in two countries, characterized by contrasting levels of digital technology integration in upper-secondary school. Propensity score analysis was applied to nationally representative PISA 2022 datasets of Singapore (n=6,606 students in 164 schools) and Morocco (n=6,867 students in 178 schools) to obtain causal estimates conditional on specified confounding factors. This causal inference method, which is infrequently employed in educational research, assesses interventions via observational data, considering temporal precedence, yielding less biased estimates by mitigating disparities between treatment and control groups. The findings showed that DET use at schools did not significantly influence students' creative thinking in Singapore, and surprisingly, it significantly decreased Moroccan students' creative thinking. Sensitivity analysis corroborated the robustness of the treatment effect estimates. The generalizability of the results is limited to the genuine educational contexts of the countries. The findings suggest that educational policymakers should be cautious about over-investment and over-reliance on digital technologies without carefully optimizing educational and curricular design for technology-enhanced creativity.
Keywords: *digital technology; creative thinking; propensity score matching; comparative analysis*

Introduction

Creative thinking skills, as a pronounced 21st century skill, has become a topic of increasing interest among educators and researchers, due to their considerable potential to augment problem-solving capabilities and foster innovation among young learners. Education systems placing this skill at the center and preparing students for the needs of the future constitute one of the cornerstones of both individual and societal progress. Yet students' creative thinking skills are globally low (i.e., students in Organization for Economic Cooperation and Development [OECD] countries scored an average of 33 out of 60 in PISA 2022) (OECD, 2023), and 15-year-old students show lower levels of creativity compared to their 10-year-old peers (OECD, 2021). Despite a misbelief among some educators that creativity is an innate trait (Aljughaiman & Mowrer-Reynolds, 2005), the extant literature has indicated that creative thinking is amenable to instruction across all levels of education and various disciplines (e.g., Beghetto & Kaufman, 2014; McDonald et al., 2020; Pikhart et al., 2024), with the most pronounced advancements occurring at the senior high school level (Yang et al., 2024). For these reasons, it is crucial to identify the factors that influence the creative thinking of 15-year-

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old students at this critical age, and the use of digital technology in the classroom has been considered as one of these factors.

Digital educational technologies (DETs) have transitioned from serving as an external tool to teaching and learning process to an unprecedented worldwide adoption and popularity that influence curriculum development, teaching strategies and evaluation techniques (Wang et al., 2024). Yet, recent empirical evidence regarding the effectiveness of digital technologies on creative thinking skills has yielded mixed results. While certain studies underscored the favorable relationship between digital technology use and creative thinking (e.g., Pikhart et al., 2024; Tang et al., 2022), others raised concerns regarding nonsignificant effects (Harianto et al., 2024) or potential disadvantages, such as diminished attention spans and an overreliance on superficial information processing (Rubin, 2012), disruptions on memory (Baron, 2021), and addiction to technology and distraction from learning (Selwyn & Aagaard, 2020). A research study concerning vocational education students revealed that intrinsic motivation, innovative pedagogical approaches, and support from industry stakeholders substantially contribute to the enhancement of creative thinking abilities, accounting for 68.7% of the variability in creative thinking skills; yet, the learning environment did not manifest a statistically significant influence on creative thinking skills (Harianto et al., 2024). A review identified that the most favorable outcomes in fostering creative thinking occurred in science discipline, while the incorporation of technology did not exhibit a significant effect on the efficacy of teaching creative thinking (Yang et al., 2024). This duality in findings suggests that the mere incorporation of technological innovations into educational settings without proper implementation–such as lack of infrastructure, psychological resistance among teachers and students to digital technology (Moorhouse, 2021), or poor digital literacy skills–may prove insufficient in improving students' creative thinking; thus, more emphasis must be placed on the current effectiveness of digital technologies in their natural settings, namely classrooms.

Furthermore, a recent meta-analysis found a high degree of heterogeneity between the studies regarding the effects of various educational technologies on creative thinking (Zaremohzzabieh et al., 2024). In the cited meta-analysis, studies that were conducted on high school students had relatively small sample sizes (n = 27 to 118), and in terms of methodological quality, most of these studies were reported to be moderate level of quality based on criteria such as allocation concealment, blinding of main outcome evaluation and attrition information. More importantly, none of those studies used a randomized controlled trial design that could provide strong causal evidence for the generalizability of the results. Propensity score matching (PSM) can be utilized in contexts where randomized experiments are prohibitively expensive or impractical. This methodology, which has been infrequently used in educational research literature, facilitates the estimation of more broadly applicable treatment effects through the creation of balanced samples derived from large observational datasets (Guo & Fraser, 2015). In PSM analyses, the phenomenon of digital technology use in the classroom can be conceptualized as a variable analogous to a treatment condition in a randomized controlled trial (i.e., classrooms that use digital technologies in the classrooms and those that do not), facilitating the delineation of treatment and control groups predicated on exposure to said variable. Given that practitioners disclose their prior experiences of digital technology use during the collection of creative thinking data in PISA, the use of digital technologies in instruction functions as a theoretical intervention that fulfills the requisite criteria of temporal precedence, which is an essential criterion for the identification of causal relationships. Furthermore, in addition to the relationship between the treatment and resultant outcome, in order to eliminate alternative explanations regarding the specified association, the treatment and control groups are meticulously balanced on a comprehensive array of covariates via PSM, and the influence of potential omitted confounders on the specified relationship is scrutinized through sensitivity analysis. Using this methodological approach on nationally representative PISA datasets enables the estimation of nationally generalizable causal relationships within the PSM framework.

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Digital Technology and Its Use in Classrooms

Digital technologies are mainly composed of Information and Communication Technologies (ICT), technologies for assessment and feedback, and mobile technologies (Pinto & Leite, 2020). DETs encompass learning materials that employ technology in curriculum-based learning areas, including, by way of illustration, online games, multimedia, cloud computing, 3D printing, and mobile computing (Kumi-Yeboah et al., 2020).

Technology in education has been shown to facilitate lifelong learning by providing students with an individualized virtual world and the freedom to easily access digital information (Haleem et al., 2022). The integration of digital technologies into educational settings increases student engagement, eases the workload of teachers, facilitates understanding of difficult subjects, and accelerates communication and information transmission (Sarkar, 2023). Learners are able to utilize DETs to augment the knowledge imparted by educators within the classroom environment and to acquire supplementary information while navigating the Internet (Prodani et al., 2022). The use of some DETs, such as augmented reality, in learning optimized cognitive load for novice learners (Poupard et al., 2023). Furthermore, digital technologies have been shown to enhance social communication, in addition to enabling the dissemination and storage of information, thereby fostering the development of students both as individuals and as a collective (Kaldırım & Tavşanlı, 2021).

In contrast to the rapid advances witnessed in the field of digital technology, the existing conditions that facilitate the integration of technological resources in educational institutions have remained relatively static (Ng, 2015) until it became an integral part of schooling during the COVID pandemic (Wang et al., 2024). To leverage digital education technologies effectively, both teachers and students require specific competencies. Nonetheless, both cohorts encounter considerable challenges in the effective utilization of these technologies within educational settings (Lamanauskas, 2010; Moorhouse, 2021). The facilitation of efficacious technological utilization by teachers necessitates that they embody a requisite level of digital literacy (Wang et al., 2024) as they play a pivotal role in integrating these technological resources into the classroom (Alberola-Mulet at al., 2021). Several factors that influence teachers' integration of DET into their teaching include their beliefs and attitudes (Johnson, 2016; Kılınç et al., 2016), their self-confidence contingent upon receiving support from training and administrators, and their constant monitoring of student progress to assess effective DET intervention.

It is imperative to acknowledge that the presence of computers equipped with adequate software in the classroom, coupled with substantial professional development for instructors, does not ensure an immediate and consistent enhancement in student grades and engagement (McKnight et al., 2016). This is attributable to the common observation that, while teachers generally acknowledge the merits of educational technologies, they frequently encounter challenges in the seamless integration of novel educational technologies. These challenges encompass a wide range of aspects, from the procurement of new technological equipment to the adaptation of curricula and pedagogical approaches to incorporate these novel educational tools (Johnson, 2016). Consequently, despite their facilitation of learning, digital technology integration has posed significant challenges for educators at all levels of the educational system.

Creative Thinking

In the dynamic environment of the 21st century, individuals need not only to consume existing knowledge but also to generate innovative ideas, adapt to changes, and shape the future. Creative thinking is a competency that enables individuals to develop unconventional solutions and has been recognized as one of the most critical skills of the 21st century (OECD, 2019). Creative thinking can be defined as "the capacity to generate many different kinds of ideas,

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manipulate ideas in unusual ways and make unconventional connections in order to outline novel possibilities that have the potential to elegantly meet a given purpose" (Ramalingam et al., 2020, p. 2). OECD (2019) defined creative thinking as "the competence to generate, evaluate, and improve original and diverse ideas," and this definition encompasses not only idea generation but also critical analysis and improvement processes. Creative thinking consists of the combination of multiple cognitive skills, including divergent thinking (OECD, 2019). Torrance (2018) and Guilford (1960) approached this skill in four fundamental dimensions: fluency (generating a large number of relevant ideas), flexibility (thinking across different categories or themes), originality (developing uncommon and new ideas), and elaboration (enriching ideas with substantial details).

Creative thinking, as a crucial component of student development in education, plays a critical role in shaping individuals' cognitive and social skills. It is critically important not only in artistic fields but also in areas such as science, technology, mathematics, and engineering (STEM), helping students develop innovative solutions to complex problems (Beghetto & Kaufman, 2014; OECD, 2022) and it contributes to the development of other 21st-century skills such as critical thinking, problem-solving, and collaboration (Lucas & Spencer, 2017). Therefore, it is of great importance for teachers to support students' creativity by creating effective learning environments (Danesh & Nourdad, 2017; Kim, 2020), especially via student-centered instructional designs (Aytaç & Kula, 2020) to enhance students' future competencies including their academic achievements, self-efficacy, and readiness for the knowledge economy (Lin, 2023).

Creative thinking in education is influenced by various positive and negative factors. Research has indicated that factors such as the flexibility of the learning environment (Davies et al., 2013), teacher support (Kozmus & Kaučič, 2022), access to technological tools (Zaremohzzabieh et al., 2024), and opportunities for autonomous learning (Orakcı, 2025) positively enhanced creative thinking. On the other hand, test-oriented education systems, short class durations, teachers' inadequate training in creative pedagogies, and assessment methods that prioritize individual student performance were among the factors that negatively affected creative thinking (Lucas, 2022).

Overall, developing this skill in education strengthens students' academic achievements and long-term learning motivation while preparing them for their future professional and social lives (Lucas & Spencer, 2017). However, flexible learning environments and encouraging creativity-inducing teaching methods are essential for this potential to emerge.

Research on the Effect of Digital Technology on Creative Thinking

Digital technologies play a significant role in enhancing students' creative thinking skills by supporting creative problem-solving processes (Göçen et al., 2023; Tang et al., 2022). Multimedia-based instructional methods, particularly in art, design, and digital media, fostered creativity by increasing self-expression and motivation (Al Hashimi et al., 2019), while problem-based learning approaches supported by digital tools enabled students to develop original solution strategies (Wang & Li, 2024). A cross-sectional study found a positive association between digital educational games and student motivation (Li et al., 2024), which is associated with elementary school students' creativity within the framework of self-determination theory (Zhang et al., 2011). Students' creative thinking skills can also be fostered through interactive, tablet-based classroom environments that provide a dynamic learning process (Kim et al., 2016; Tang et al., 2022). In summary, teachers' successful implementation of DET into their teaching practices (Bereczki & Kárpáti, 2021) and effective integration of digital technologies into the curriculum (Yalcinalp & Avci, 2019) were reported to positively influence students' creative thinking skills.

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The negative effects of digital technologies on creative thinking are also a notable topic in the literature. Based on increasing evidence in the cognitive neuroscience literature, while the use of digital technologies facilitates the acquisition of specific cognitive skills, certain higher-order cognitive skills, characterized by deep analytical thinking, experience a decline due to changes in neural circuitry in the brain (Cavanaugh et al., 2016). Moreover, Vilarinho-Pereira and Fleith (2021) argued that when technology is misaligned with instructional objectives and used in an unstructured manner, it can lead to distractions in the classroom that hinder students' creative processes. Similarly, Elphick (2018) suggested that the mere presence of digital tools is insufficient, and inappropriate or their excessive use can disrupt students' focus, limiting the development of creative skills. The structural and pedagogical challenges associated with effective DET integration include poorly designed digital integration, which fails to deliver the expected creative benefits, resulting in underdeveloped creative capacities in students (Henriksen et al., 2021; Rubin, 2012).

The influence of digital technology on creative thinking in the classroom is significantly shaped by various contextual factors, particularly the pedagogical strategies employed and the proficiency of teachers in integrating these tools. Interactive and dialogic teaching methods, which, when supported by digital tools, can effectively nurture creativity (Pifarré, 2019; Tusiime et al., 2019). However, these benefits are contingent upon comprehensive teacher training and the alignment of digital technologies with clear pedagogical objectives. The literature underscores that the successful integration of digital technology requires both a strong technological infrastructure and well-trained educators who can effectively utilize these tools (Gangmei & Thomas, 2025). Furthermore, socio-economic factors play a crucial role as disparities in access to digital resources (Micheli, 2015) can limit the creative development opportunities of certain student groups (Kim & Li, 2021). In conclusion, the challenge lies not only in properly incorporating technology into the curriculum to improve students' creative thinking skills but also in ensuring equitable access and contextually appropriate use of these tools, enabling all students to fully benefit from technology-enhanced learning.

Relevant Covariates

To mimic randomized controlled trials, sociodemographic covariates that may have a potential effect on selection into treatment and control groups or those that may impact the outcome variable should be balanced in PSM analyses in order to address the endogeneity problem (Guo & Frazer, 2015). Endogeneity emerges when the treatment variable exhibits an association with confounding factors that simultaneously influence the outcome, resulting in distorted estimates of causal impacts. PSM assists in alleviating endogeneity by minimizing selection bias in observational research.

The treatment variable, digital technology use in schools, was found to be influenced by access to digital technology resources in classrooms and schools (Alotaibi, 2023), school type (Gómez-Fernández & Mediavilla, 2020), and geographical region (Habibi et al., 2023). Furthermore, creative thinking was found to be influenced by student growth mindset (Anderson, 2024), teaching method (Zhong et al., 2024), and school type (Zaremohzzabieh et al., 2024). In a comprehensive meta-analysis, the influence of socioeconomic status (SES) on the creative thinking abilities of students was statistically significant; however, this influence appeared to diminish as students advanced from elementary education to college (Acar et al., 2022). Nevertheless, SES as a 'family cultural capital' influences students' digital technology use and creative thinking skills (Ren et al., 2022), which also influences K-12 teachers' use of digital technology as a 'second-level digital divide' in promoting students' higher-order thinking (Reinhart et al., 2011). While prior research indicated differing creative thinking patterns between genders (Dudek et al., 1993), more recent findings suggested otherwise (e.g.,

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Wu et al., 2017). Therefore, controlling for the impact of gender alongside previously mentioned variables is essential to mitigate potential selection bias.

Research Aim

Majority of cited studies employed digital technologies as a medium as a part of a more complex instructional design and they were compared to the conventional instructional designs which did not isolate the effect of DETs from widely established effective constructivist teaching and learning practices such as collaborative or inquiry-based learning practices, enhanced communication, using representations, and making connections among concepts and subjects. In this study, we solely focused on the effect of this medium on student creative thinking regardless of the enacted curriculum. As a leading authority in educational assessment, the Institute of Education Sciences (IES) advocates for research methodologies that produce robust causal evidence, including randomized controlled trials and balanced quasi-experimental designs (IES, 2017). Previous research has yielded mixed results regarding the impact of DETs on individual creativity. Therefore, it is crucial to guide future research with causal evidence regarding these mixed results. Furthermore, despite large investments in equipping schools with digital technologies, there is a lack of generalizable evidence regarding the effectiveness of using DETs in their authentic school settings. Thus, this research seeks to provide evidence to inform future research and further policy decisions.

Based on the theoretical and empirical discussion above, the purpose of this study was to fulfill the aforementioned research gaps by providing evidence on the effect of digital technology interventions in 15-year-old students' creative thinking skills in schools' natural settings by analyzing nationally representative PISA 2022 dataset using the PSM method. This study sought to find the extent to which digital technology use in schools improves 15-year-old students' creative thinking skills in Singapore and Morocco. According to PISA 2022 data, Singapore had a higher frequency of technology use in schools, while Morocco had one of the lowest frequencies of technology use in schools. By cross-comparison of high-tech and low-tech countries, it was intended to derive less biased inference when evaluating whether DET improves students' creative thinking skills regardless of the prevalence of digital technology use in the educational context. Based on the previous research indicating conflicting evidence regarding the effect of digital technologies on creative thinking, it is hypothesized that the effect is not significant; however, the treatment effect is hypothesized to be slightly higher for Singapore due to higher prevalence of the implementation of DET at schools that might have improved digital literacy of students and teachers. The findings are intended to inform researchers, policymakers, and school practitioners pertaining to the effectiveness of digital technologies in improving students' creative thinking skills within schools.

Research Methodology

Research Design

This study utilized PISA 2022 data, specifically, the datasets of Singapore and Morocco. The design and data analysis for current study were carried out between December 2024 and February 2025. Creative thinking was the outcome variable, and DET use in upper secondary school was the treatment variable. Several covariates were used to balance the sample characteristics on the treatment variable. PSM analyses were employed to create comparable groups, allowing for a less biased assessment (i.e., by balancing treatment and control groups on specified covariates) of the effect of teachers' educational technology use on students' creative thinking.

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Sample

The international PISA 2022 assessment, conducted in 81 participating countries, focused on the performance of 15-year-old students in the core domains of mathematics, science, and reading, as well as in the domain of creative thinking. This assessment used a two-stage stratified sampling design, which includes probabilistic sampling to represent the corresponding population (OECD, 2024a). Two countries were included in the analyses: Singapore (n = 6,606 students in 164 schools) and Morocco (n = 6,867 students in 178 schools). The selection of these countries was predicated on their disparate levels of DET utilization in educational institutions, which are characterized by high and low prevalence, respectively. In Singapore, 15-year-old students are generally in their first year of upper secondary education (i.e., Secondary 3). In Morocco, they are either in the Tronc Commun (bridge year) or the initial year of the Baccalauréat, both corresponding to upper secondary. Because the objective of this study was to ascertain the effect of the implementation of DET in schools on creative thinking skills, the comparison of the treatment effects across these countries serves to eliminate the potential interpretative bias that may arise from the varying levels of digital technology adoption within educational systems. Furthermore, the utilization of these large datasets of the countries facilitates the accurate evaluation of causal effects in implementing greedy matching techniques, provided that the PSM assumptions are met (Guo & Frazer, 2015). 15-year-old students' and school administrators' responses to student and school questionnaires were used in this study.

Instruments

Treatment Variable: The Use of Digital Educational Technology at School

PSM analysis is a commonly used method for the evaluation of an intervention. In the PISA 2022 assessment framework, 'digital resources' refer to digital devices or hardware (e.g., tablets, computers, smartphones), software (e.g., Apps, educational learning tools), and online platforms (e.g., websites, web portals). This variable was used to estimate the treatment effect on the treated (ATT), namely, the average difference in creative thinking between those who were treated with DET at school and their matched non-users had these non-users been exposed to the treatment. The testing period for the PISA 2022 assessment, excluding a limited number of nations, took place during March and April in the academic calendar (OECD, 2023). Consequently, the experience of the treatment groups with DETs encompassed at least half of the academic year. Given that extant literature has affirmed that creative thinking can be proficiently fostered through instructional techniques at every educational level and throughout various academic disciplines (e.g., Beghetto & Kaufman, 2014; McDonald et al., 2020; Pikhart et al., 2024), this period of intervention should yield valid inferences. The researchers believe that this treatment effect has important implications for policymakers considering overinvestment in DETs.

A binary variable for this hypothetical intervention (i.e., whether or not DETs are implemented at schools) was created using the answers to the item "Educational software, games or Apps, other learning tools" to the stem question of "This school year, how often did you use the following <digital resources> at school?". The 4-point Likert-type response scale options included 1 (*Never or almost never*), 2 (*About once or twice a month*), 3 (*About once or twice a week*), 4 (*Every day or almost every day*), and 5 (*Several times a day*). Table 2 lists the distribution of DET use in the countries using the original data. The binary variable was coded 0 if 'Never or almost never' option was selected and 1 for other responses.

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Outcome Variable

The outcome variable is creative thinking. The PISA 2022 creative thinking assessment framework was developed to evaluate students' proficiency in generating, evaluating, and refining ideas across four specific domains of application: written expression, visual expression, social problem-solving, and scientific problem-solving (OECD, 2024a). Rather than providing a single point estimate representing the extent of creative thinking skills, the PISA 2022 employed a nuanced approach by offering multiple proficiency values. Specifically, for countries that have implemented the creative thinking tests, the assessment provides ten imputed plausible values. This methodological decision is noteworthy as it enables a more precise estimation of measurement error, because students respond to a subset of items instead of the entire scale. Pooled estimates obtained from imputed item scores served as a more accurate representation of their actual skills (See PISA 2022 Technical Report [OECD, 2024a] for more information). The scores of the creative thinking scale ranged from 0 to 60 points–a score of 60 indicates a perfect score across 32 test items– and imputed scores reflected estimated performance on a hypothetical comprehensive test of all 32 items (OECD, 2024b).

Covariates

To correctly model the selection into treatment, a rich set of covariates (student, family and school background measures) that may influence digital technology use at schools or creative thinking were selected. Because the inclusion of covariates in the matching process is directly linked to the internal validity of PSM, covariates that are evidenced to be linked to the treatment and outcome variables were selected (See Table 1). The variable 'school type' was answered by school administrators, and other items were answered by students.

In the context of PSM analyses, binary variables were formulated for these dichotomous constructs. For k-levels of a multicategorical variable (i.e., the number of books present in the household), k-1 dummy-coded variables were generated to mitigate the dimensionality problem and to facilitate a more equitable balance between treatment and control cohorts (Guo & Frazer, 2015).

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Table 1
Descriptive Information for Covariates

Covariate	PISA Item	Response range	Missing (%)
Female*	Gender	0=Male 1=Female	S: 0.00 M: 0.00
Growth mindset	Growth mindset	S: Min = -3.599 Max = 2.029 M: Min =-3.602 Max =3.372	S: 0.06 M: 19.71
Other language*	What language do you speak at home most of the time?	0=Language of the test 1=Other language	S: 0.02 M: 0.61
Mother education r	What is the <highest level of schooling> completed by your mother?	1=No education 2=Primary education 3=Lower secondary 4=Upper secondary with direct access to tertiary education 5=Upper secondary with no direct access to tertiary education	S: 0.68 M: 3.08
Father education r	What is the highest level of schooling completed by your father?		S: 0.88 M: 4.06
Books at home*	How many books are there in your home?	1 = There are no books 2 = 1-25 books 3 = 26-100 books 4 = More than 100 books	S: 0.03 M: 0.53
Digital education tech at home*	Which of the following are in your home? Educational software of Apps	0=No 1=Yes	S: 0.27 M: 3.18
Computer at home*	Which of the following are in your home? A computer (laptop, desktop, or tablet) that you can use for schoolwork	0=No 1=Yes	S: 0.08 M: 1.91
Internet at home*	Which of the following are in your home? Internet access (e.g., Wi-fi) (excluding through smartphones) at home	0=No 1=Yes	S: 0.09 M: 2.14
ICT availability	ICT resources at school	S: Min = -5.624 Max = 0.406 M: Min =-5.624 Max =0.406	S: 0.00 M: 0.22
School type	School type	1=Private independent 2=Public	S: 0.00 M: 0.00

Notes. * Variables recoded into binary variables or with less dimension; r: Reverse coded;
S: Singapore; M: Morocco

Data Analysis

PSM analysis performs significantly better when implemented on large datasets (Rubin, 1997), which the use of national datasets offers this advantage. Students who did not specify their treatment or control condition were excluded from the further analyses (141 from the Singapore dataset and 765 from the Morocco datasets). Through PSM analyses, each student in the control group of the respective country (1438 students in Singapore and 3675 students in Morocco) was matched with a student whose school implemented DET (4930 students in Singapore and 2356 students in Morocco) using their propensity scores.

Multivariate outliers possess the potential to distort estimates of population parameters (Leys et al., 2018). For the purpose of identifying multivariate outliers, the 'minimum covariance determinant estimator' (Verardi & Dehon, 2010), which represents a more robust

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adaptation of the Mahalanobis distance, was employed. Chen et al. (2023) reported that the characteristics of random responders were being male, possessing a limited number of books at home, and infrequently or never engaging in communication in the test language. In order to mitigate threats to the ecological validity of the nationally representative datasets, only extreme multivariate outliers–with unusual Mahalanobis distances–with at least one of the characteristics of random responders, were excluded from the datasets. In the Singapore and Morocco datasets, respectively, 97 and 71 multivariate outliers were removed. After data management, final sample sizes were 6368 for Singapore and 6031 for Morocco.

Additionally, conducting PSM analyses on covariates with missing data risks compromising the validity of treatment effect estimates (D'Agostino & Rubin, 2000). In the Singapore dataset, all covariates had less than one percent of missing cases. In the Morocco dataset, the growth mindset variable had 19.71% missing cases, and other variables had 4.06% or less missing cases. The analysis of missing value patterns revealed that the missing data mechanism was missing at random. Because variables with missing data consisted of continuous, ordinal, and binary variables, the multivariate imputation by chained equations (MICE) method was employed in Stata software. This methodological approach executes a sequence of univariate models that subsequently leverage the posterior predictive distribution of imputed values on a variable-by-variable basis, thereby obviating the necessity for a multivariate normal distribution (Bouhlila & Sellaouti, 2013) and replacing missing values with corresponding variable type. By applying the MICE method, a total of ten imputed datasets were generated for the datasets of both countries. In each dataset, one of the ten 'plausible values in creative thinking' was retained.

Propensity score analysis, a non-experimental causal inference method, was conducted on these imputed datasets. The performed analyses included the modeling of covariates, calculating propensity scores, checking the assumptions of PSM, and estimating the treatment effects on the treated (ATT). First, a pre-specified set of fixed-effect covariates was identified that could explain alternative explanations for the selection into the treatment and variables affecting the outcome. The evaluation of their inclusion was assessed through formal tests and statistics, including the non-parametric Wilcoxon Rank Sum test, standardized differences between groups, and visual inspection of their distributions across treatment conditions. Through this process, a variety of covariates that showed evidence of imbalanced distribution across the treatment or control groups were delineated (see Table 1) to address the issue of selection bias. Several covariates that are available in the PISA dataset (i.e., parents' immigrant background, students' grade repetition, and school location) did not meet any of these diagnostics for inclusion. Propensity scores for treatment and control groups, conditional on the selected covariates, were calculated. Given the ambiguity concerning the *probability* of receiving treatment in non-experimental designs, these propensity scores are utilized to evaluate the likelihood of assignment to the treatment and control groups based on the observed confounding factors (Rubin, 2001). Before engaging in analyses on balanced samples and deriving causal inferences through caliper matching method using *psmatch2* command in Stata–with caliper size of 0.10 and the imposition of common support region, evidence obtained for the two foundational assumptions of PSM: the strong ignorability of treatment assignment condition and the stable unit treatment value assumption (SUTVA) (Guo & Frazer, 2015). These assumptions were evaluated by examining the balance of covariates between the treatment and control groups before and after the matching process, scrutinizing the common support region of the propensity scores across the groups, and conducting sensitivity analyses (Powell et al., 2019; Rosenbaum & Rubin, 1983). The covariate balance was evaluated via the calculations of the percentages of bias on both unmatched and matched samples with the objective of achieving a bias less than 10% for each covariate and a mean bias under 5%, and adequate overlap in the distributions of propensity scores between the treatment and control

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groups. Because caliper matching yields less biased treatment effect estimates than optimal and nearest neighbor matching (Austin, 2013), the estimates were calculated using this method. An additional model was performed to examine the robustness of the results. Because the inclusion of schools' ICT resources may possibly dilute the treatment effect, for example, implementation of DETs may lead to more school ICT resources, an alternative model excluding this covariate in the estimation of propensity scores was analyzed. Consequently, sensitivity analyses using the *sensatt* command (preceded by the estimates obtained using the *attk* command) in Stata were conducted after the execution of PSM analyses in each imputed dataset of each country to determine the simulated impact of unaccounted confounders. The simulated parameters for this confounder U is set at $p_{11} = .40$, $p_{10} = .30$, $p_{01} = .30$ and $p_{00} = .20$. The sensitivity analysis helps in estimating the effect of the treatment condition on the outcome in the presence of the simulated effect of U by assigning these moderate-to-high probabilities to U of being included in treatment and conditions (Nannicini, 2007). Propensity score-weighted estimations with bootstrapped standard errors and sensitivity analyses for each imputed dataset were performed with 500 replications, and they were aggregated for each respective country employing Rubin's formula (Li et al., 1991).

Due to the complex sampling design of the PISA survey, student weights were incorporated into the PSM analysis in order to alleviate biases that may arise from variations in selection and/or response rates. This integration yields a generalizable estimation of a treatment effect (Ridgeway et al., 2015). Additionally, prior to conducting propensity score analyses, the intraclass correlation coefficient (ICC) is calculated through an unconditional ANOVA utilizing random effects, as suggested by Raudenbush and Bryk (2002). Given the substantial ICC values for datasets of both countries (.189 for Singapore and .332 for Morocco), the cluster variable (i.e., school ID variable) in conjunction with the student weight variable was employed in the calculation of propensity scores. All analyses were conducted using Stata 14.1 software.

Research Results

Descriptive Results

Prior to constructing a binary treatment variable, the distribution of digital technology implementation at schools using the raw data is given in Table 2. In all levels of digital technology use at schools, Singapore had a higher frequency compared to Morocco. Pooled average creative thinking score was also higher for Singapore (M= 41.141; Linearized SD = 0.123) compared to Morocco ($\overline{X}M$ = 15.822; Linearized SD = 0.160).

Table 2
Distribution of Digital Educational Technology Use at School

Responses	Singapore (%)	Morocco (%)
Never or almost never	19.61	52.56
About once or twice a month	20.00	11.95
About once or twice a week	24.44	10.46
Every day or almost every day	17.57	8.46
Several times a day	14.48	7.75
Nonresponse/Missing	3.90	8.83

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Propensity Score Matching Estimates

The results of PSM analysis using caliper matching are given in Table 3. Empirical evidence indicated that digital technology implementation at schools in Singapore, where the frequency of the use of DET is quite high, did not significantly increase 15-year-old students' creative thinking (τ=0.947, *SE* = 0.531, *ns*). Surprisingly, in Morocco, where the frequency of the use of DET implementation at schools is considerably lower, the use of digital technology use significantly decreased students' creative thinking ability (τ = -2.687, *SE* = 0.469, $p < .001$).

Table 3
Pooled Treatment Effects of Digital Technology Use on Creative Thinking

Countries	Caliper Matching		Alternative Model*	
	ATT	SE	ATT	SE
Singapore	0.947	0.531	1.152	0.571
Morocco	-2.687***	0.469	-2.904***	0.463

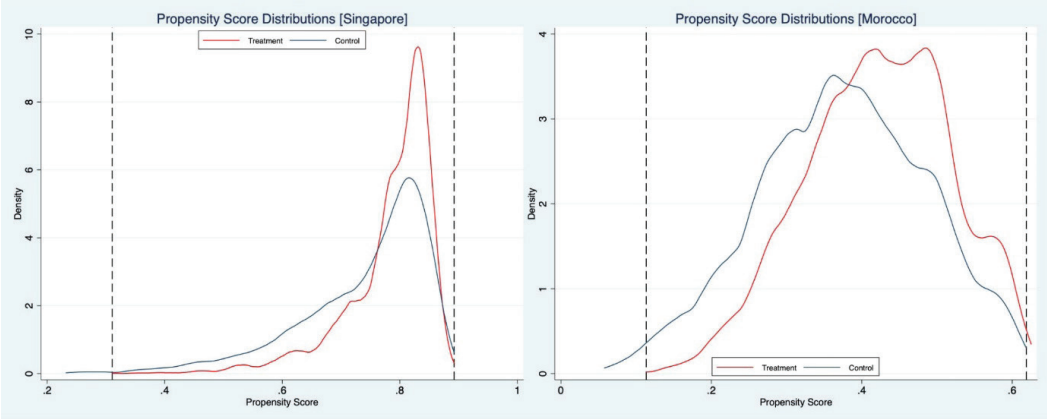
Notes. * Caliper matching estimates without the inclusion of school ICT resources as covariate. Pooled estimates were derived using weighted and clustered propensity scores from 10 imputed datasets.

The results of the alternative model, where the school's ICT resources were excluded from the balanced covariates, the treatment effect increased in Singapore (τ =1.152, *SE* = 0.571, *ns*) while the effect decreased in Morocco (τ =-2.904, *SE* = 0.463, p<.001).

Balance Diagnostics

The validity of ATT estimates is contingent on the satisfaction of the PSM. Figure 1 shows a high degree of overlap between the propensity scores of the treatment and control groups in both countries.

Figure 1
Propensity Score Distributions in Singapore and Morocco



Notes. The graphs were derived using the first imputed datasets of respective countries. The graphs of other imputed datasets were almost identical.

In addition, the quality of the matching process in PSM analysis was gauged by the statistics of observations within the common support region (See Table 4). More than 99% of cases were on common support region for both countries, which ensured the comparability of the treatment and control groups.

Table 4
On Support vs. Off Support Cases in the Matching Process

Country	Treatment assignment	Off support	On support	Total
SGP	Untreated	6	1432	1438
	Treated	0	4930	4930
	Total	6	6362	6368
MOR	Untreated	36	3639	3675
	Treated	2	2354	2356
	Total	38	5993	6031

The results on covariate balance showed that the bias in each covariate is significantly removed as a result of the caliper matching process. After the matching, the standardized mean differences of each covariate for unmatched and matched samples were less than 0.10. After matching the Singapore datasets, the pseudo R^2 values decreased from .038 to .003, and the mean bias decreased from 13.63% to 2.14%. Similarly, for Morocco, the pseudo R^2 values decreased from .039 to .002, and the mean bias dropped from 13.17% to 2.26% as a result of the covariate matching process. In other words, the PSM method removed approximately 84% and 83% of the bias due to covariate imbalance, respectively.

Sensitivity Analysis

The findings indicated that ATT estimates exhibited robustness against unmeasured confounding variables, as demonstrated through sensitivity analysis in Table 5. The sensitivity analysis showed that the estimated ATT exhibited minimal sensitivity to unobserved variables, as evidenced by the relatively small changes in treatment effect estimates, thereby reinforcing the causal interpretation of the results obtained. The estimated selection effect of 1.74 for Singapore (and 1.72 for Morocco) signifies that, in the presence of an unobserved confounder *U*, the odds of a student attending a school that implemented DET would be augmented by a factor of 1.74 (or 1.72 for Morocco). Likewise, the outcome effect of 1.67 for Singapore (or 1.571 for Morocco) implies that *U* would amplify the odds of students exhibiting elevated levels of creative thinking by 1.67 times (or 1.57 times for Morocco). The minimal variation in ATT (9.4% in Singapore and 8.7% in Morocco) indicated that, even in the hypothetical presence of such a confounder with a moderate-to-high levels of selection and outcome effects, the estimated treatment effects remain largely unaffected.

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Table 5
Sensitivity Analysis Results

	Singapore	Morocco
ΔATT (%)	9.4	8.7
Γ	1.741	1.723
Λ	1.669	1.571

Notes. $\Delta ATT\ (\%) = 100*(\tau_{baseline} - \tau_{simulated})/(\tau_{baseline})|$;
Γ: Selection effect; Λ: Outcome effect

Discussion

This study partially provided empirical evidence for the research hypothesis. Using nationally representative PISA 2022 datasets, we found that DET use at schools did not significantly influence students' creative thinking skills in Singapore, and the treatment effect was higher compared to that of Morocco. The unexpected result was the negative effect of DET use on students' creative thinking skills in Morocco. While some studies underlined the positive relationship between the use of digital technology in the classroom and creative thinking (Bereczki & Kárpáti, 2021; Göçen et al., 2023; Naharia et al., 2024; Tang et al., 2022; Wang & Li, 2024; Yalcinalp & Avci, 2019), other studies reported non-significant effects (Harianto et al., 2024; Moorhouse, 2021) or expressed concerns about its detrimental effects (Cavanaugh et al., 2016; Elphick, 2018; Rubin, 2012; Vilarinho-Pereira & Fleith, 2021). Our results provided causal evidence for a non-significant effect for Singapore and a negative effect for Morocco. Henriksen et al. (2021) posited that the utilization of suboptimal or inadequately designed digital learning environments falls short of delivering the anticipated creative benefits to students. This situation is more evident in the case of Morocco, as the use of digital educational technologies resulted in an undesired negative effect on students' creative thinking skills. The extant literature highlights that the successful integration of digital technology requires both a robust technological infrastructure and well-trained educators who can effectively utilize these tools (Gangmei & Thomas, 2025). In this respect, it can be said that the use of digital technology in the classroom environment depends significantly on different factors in terms of increasing students' creative thinking skills.

These outcomes may be attributable to a number of factors, including the absence of adequate infrastructure and the psychological resistance to digital technology exhibited by teachers and students (Moorhouse, 2021). In order to utilize digital educational technologies in an effective manner, both teachers and students must possess certain competencies. However, both groups face significant challenges in using these technologies effectively in educational settings (Lamanauskas, 2010; Moorhouse, 2021). The effective integration of technology into the educational environment by educators, hinges upon their possession of the requisite level of digital literacy (Wang et al., 2024). Although three-quarters of students are confident in using DETs at school (OECD, 2023), only 17-21% of teachers were found to be 'versatile users' of DETs (Lee, 2024). Teachers, in particular, assume a pivotal role in the integration of technological resources within the classroom setting (Alberola-Mulet et al., 2021). Students' creative thinking skills can be enhanced by teachers' implementation of instructional methods that can nurture students' creative thinking and creativity-inducing learning environments (Aytaç & Kula, 2020; Kim, 2020). For example, various studies have found that project-based learning (Chen et al., 2022) and STEAM (science technology, engineering, art, and mathematics) education (Erol et al., 2023) contribute to the development of students' creativity. Combined together, positive effects of digital technologies on students' creative thinking depend on pedagogically and

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digitally competent teachers who can harness the affordances of subject-appropriate digital technologies with effective instructional designs.

In order to assess the robustness of the causal links for the respective countries, an alternative model was performed in which the treatment and control groups were not matched in terms of school ICT resources. This analysis found that matching students without similar levels of school ICT resources had slightly spurious effects on the DETs' effect on students' creative thinking skills in Singapore. However, the inflated effect was also not statistically significant. By controlling for school ICT resources, a portion of the explained variance in creative thinking through this confounder was eliminated. Consequently, failure to account for school ICT resources leads to an overestimation of the effect of DET on the creative thinking skills of Singaporean students. This change may occur if schools that implement higher levels of creative learning environments in schools with more ICT resources, which may concomitantly manifest heightened levels of creative thinking, are disproportionately represented within the treatment cohort. Once a balanced distribution of school ICT resources is achieved, the treatment effect is more precisely estimated without this confounder. Nevertheless, it was beyond the scope of this study to determine the association of school ICT resources with either or both DET use and creative thinking skills, as well as the direction of the association.

Conversely, in Morocco, the confounding mechanism of school ICT resources is different. The failure to account for the effect of school ICT resources in treatment and control cohorts led to an exacerbation of the negative effect. The decline in the treatment effect can be attributed to the imbalance in the distribution of schools that implement DETs without incorporating creative activities and an environment within the treatment group. This misalignment points to a critical issue in education: the integration of digital technology into the curriculum may not always align with the current infrastructure, impeding student creativity. Insufficient ICT support may also cause frustration among teachers and learners, leading to disengagement and lower learning outcomes. This underlines the need for comprehensive training programs for teachers to enable them to use resources effectively and promote a creative learning environment. In summary, the investigation of school ICT resources reveals a multifaceted relationship with the utilization of DETs in Singapore and Morocco. It is imperative to acknowledge this confounder to ensure the accuracy of estimates regarding the impact of teachers' use of DETs on students' creative thinking skills. Further investigation is necessary regarding the direct and indirect effects of school ICT resources on students' creative thinking skills and DET use more comprehensively.

Limitations

In addition to the possibility of self-report bias, one of the limitations inherent in the study was the lack of control over the prior levels of creative thinking exhibited by students. The PISA 2022 dataset did not include that variable. Nevertheless, given that creative thinking is susceptible to pedagogical intervention (McDonald et al., 2020; Yang et al., 2024), which may be enhanced contingent upon the influence of the use of DETs, and considering that the outcomes of the sensitivity analysis, with a hypothetical moderate-to-high level of confounder, did not drastically alter the estimates of the treatment effects, it can be posited that the impact of this variable is less likely to change the interpretation of the results. While the engagement in creative thinking activities outside schools may also serve as an extraneous variable influencing the results, the extent to which these activities could pertain to school-related assignments remains ambiguous. Consequently, this particular variable was not included as a covariate. Furthermore, neither the proficiency levels of teachers in implementing DETs nor the digital literacy competencies of students were delineated within the selection criteria, which may account for a portion of the variance regarding the disparate results compared to prior research that presupposes optimal conditions. Thus, the findings can only be generalized to the authentic educational contexts within these nations.

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Conclusions and Implications

A rapid and widespread adoption of digital technologies is occurring in educational settings around the world. Yet the evidence proverbially showed that policymakers are 'putting the cart before the horse'. This study revealed causal evidence that the widespread implementation of digital educational technologies was not only ineffective in enhancing Singaporean students' creative thinking skills, but it also exerted a detrimental impact on Moroccan students' respective skills. Therefore, it is advisable to adopt a cautious approach towards perceiving DETs as a panacea for educational objectives. It is recommended that educational policymakers exercise caution in over-investment in digital technologies and over-reliance on their implementation without carefully optimizing instructional and curricular design, along with improving the digital literacy of teachers and students for technology-enhanced creative learning environments. The implementation of student-centered teaching methods can be encouraged to foster creative thinking in students. Additionally, it is imperative that professional development programs are implemented to enhance teachers' proficiency in the utilization of digital technologies, given that insufficient digital literacy among teachers and a deficit in technological support within schools may hinder the potential benefits of DET use on creative thinking from being realized. Further empirical research is needed to explore and guide the development of educational policies that transition the *efficacy* of the research regarding the use of digital technology in enhancing students' creative thinking skills into nationwide *effectiveness* while alleviating its challenges, ultimately fostering a rich learning environment conducive to creativity and innovation.

Declaration of Interest

The authors declare no competing interest.

References

Acar, S., Tadik, H., Uysal, R., Myers, D., & Inetas, B. (2022). Socio-economic status and creativity: A meta-analysis. *The Journal of Creative Behavior, 57*(1), 138–172. https://doi.org/10.1002/jocb.568

Al Hashimi, S. A., Al Muwali, A. A., Zaki, Y. E., & Mahdi, N. A. (2019). The effectiveness of social media and multimedia-based pedagogy in enhancing creativity among art, design, and digital media students. *International Journal of Emerging Technologies in Learning (IJET), 14*(21), Article 176. https://doi.org/10.3991/ijet.v14i21.10596

Alberola-Mulet, I., Iglesias-Martínez, M.J., & Lozano-Cabezas, I. (2021). Teachers' beliefs about the role of digital educational resources in educational practice: A qualitative study. *Education Sciences, 11*(5), Article 239. https://doi.org/10.3390/educsci11050239

Algujhaiman, A., & Mowrer-Reynolds, E. (2005). Teachers' conceptions of creativity and creative students. *The Journal of Creative Behavior, 39*(1), 17–34. https://doi.org/10.1002/j.2162-6057.2005.tb01247.x

Alotaibi, M. S. (2023). Factors influencing early childhood educators' use of digital educational aids: A sequential explanatory study. *SAGE Open, 13*(4). https://doi.org/10.1177/21582440231217727

Anderson, R. C. (2024). Creative development as an agentic process: Five distinct trajectories of divergent thinking originality across early adolescence. *Learning and Individual Differences, 112*, Article 102448. https://doi.org/10.1016/j.lindif.2024.102448

Austin, P. C. (2013). A comparison of 12 algorithms for matching on the propensity score. *Statistics in Medicine, 33*(6), 1057–1069. https://doi.org/10.1002/sim.6004

Aytaç, T., & Kula, S. S. (2020). The effect of student-centered approaches on students' creative thinking skills: A meta-analysis study. *International Journal of Contemporary Educational Research, 7*(2), 62–80. https://doi.org/10.33200/ijcer.723894

Baron, N.S. (2021). Know what? How digital technologies undermine learning and remembering. *Journal of Pragmatics, 175*, 27–37. https://doi.org/10.1016/j.pragma.2021.01.011

Beghetto, R. A., & Kaufman, J. C. (2014). Classroom contexts for creativity. *High Ability Studies*, *25*(1), 53–69. https://doi.org/10.1080/13598139.2014.905247

Bereczki, E. O., & Kárpáti, A. (2021). Technology-enhanced creativity: A multiple case study of digital technology-integration expert teachers' beliefs and practices. *Thinking Skills and Creativity*, *39*, Article 100791. https://doi.org/10.1016/j.tsc.2021.100791

Bouhlila, D. S., & Sellaouti, F. (2013). Multiple imputation using chained equations for missing data in TIMSS: A case study. *Large-Scale Assessments in Education,* 1, Article 4. https://doi.org/10.1186/2196-0739-1-4

Cavanaugh, J. M., Giapponi, C. C., & Golden, T. D. (2016). Digital technology and student cognitive development: The neuroscience of the university classroom. *Journal of Management Education*, *40*(4), 374–397. https://doi.org/10.1177/1052562915614051

Chen S. Y., Lai C. F., Lai Y. H., & Su Y. S. (2022). Effect of project-based learning on development of students' creative thinking. *International Journal of Electrical Engineering & Education. 59*(3), 232–250. https://doi.org/10.1177/0020720919846808

Chen, J., van Laar, S., & Braeken, J. (2023). Who are those random responders on your survey? The case of the TIMSS 2015 student questionnaire. *Large-Scale Assessments in Education, 11*, Article 37. https://doi.org/10.1186/s40536-023-00184-6

D'Agostino, R. B., & Rubin, D. B. (2000). Estimating and using propensity scores with partially missing data. *Journal of the American Statistical Association, 95*(451), 749–759. https://doi.org/10.2307/2669455

Danesh, M., & Nourdad, N. (2017). On the relationship between creative problem solving skill and EFL reading comprehension ability. *Theory and Practice in Language Studies, 7*(3), 234–240. https://doi.org/10.17507/tpls.0703.10

Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative learning environments in education–A systematic literature review. *Thinking Skills and Creativity, 8*, 80–91. https://doi.org/10.1016/j.tsc.2012.07.004

Dudek, S. Z., Strobel, M. G., & Runco, M. A. (1993). Cumulative and proximal influences on the social environment and children's creative potential. *The Journal of Genetic Psychology*, *154*(4), 487–499. https://doi.org/10.1080/00221325.1993.9914747

Elphick, M. (2018). The impact of embedded ipad use on student perceptions of their digital capabilities. *Education Sciences, 8*(3), 1–12. https://doi.org/10.3390/educsci8030102

Erol, A., Erol, M., & Başaran, M. (2023). The effect of STEAM education with tales on problem solving and creativity skills. *European Early Childhood Education Research Journal, 31*(2), 243–258. https://doi.org/10.1080/1350293x.2022.2081347

Gangmei, N., & Thomas, K. A. (2025). Teachers' technology proficiency for quality learning and teaching–A scoping review. *International Journal of Educational Reform, 0*(0). https://doi.org/10.1177/10567879251316213

Göçen, G., Demirtaş-Tolaman, T., & Azizoğlu, N. İrem. (2023). Using technology to support creative writing: How it affects teachers' digital writing skills and their gains from digital technology. *International Journal of Psychology and Educational Studies*, *10*(2), 422–440. https://doi.org/10.52380/ijpes.2023.10.2.1039

Gómez-Fernández, N., & Mediavilla, M. (2020). What are the factors that influence the use of ICT in the classroom by teachers? Evidence from a census survey in Madrid. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3685809

Guilford, J. P. (1960). Frontiers in thinking that teachers should know about. *The Reading Teacher, 13*(3), 176–182. https://www.jstor.org/stable/20197254

Guo, S., & Fraser, M. W. (2015). *Propensity score analysis: Statistical methods and applications* (Vol. 11, 2. Edition). SAGE publications.

Habibi, A., Sofyan, S., & Mukminin, A. (2023). Factors affecting digital technology access in vocational education. *Scientific Reports, 13*, Article 5682. https://doi.org/10.1038/s41598-023-32755-6

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers, 3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Harianto, B. B., Pambudiyatno, N., & Irfansyah, A. (2024). Analysis of factors increasing creative thinking in vocational education. *Indonesian Journal of Applied and Industrial Sciences (ESA)*, *3*(5), 439–458. https://doi.org/10.55927/esa.v3i5.11594

Henriksen, D., Creely, E., Henderson, M., & Mishra, P. (2021). Creativity and technology in teaching and learning: A literature review of the uneasy space of implementation. *Educational Technology Research and Development*, *69,* 2091–2108. https://doi.org/10.1007/s11423-020-09912-z

Institute of Education Sciences (IES) (2017). *What works clearinghouse: Standards handbook* (Version 4.0).

IES. https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_standards_handbook_v4.pdf

Johnson, A. M., Jacovina, M. E., Russell, D. E., & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In S. A. Crossley & D. S. McNamara (Eds.), *Adaptive educational technologies for literacy instruction* (pp. 13–29). Taylor & Francis.

Kaldırım, A. & Tavşanlı, Ö. F. (2021). A thematic review of using digital teaching technologies in Turkish language teaching. *Journal of Educational Technology & Online Learning, 4*(2), 70–95. https://doi.org/10.31681/jetol.898014

Kılınç, E., Kılınç, S., Kaya, M., Başer, E., Er Türküresin, H., & Kesten, A. (2016). Teachers' attitudes toward the use of technology in social studies teaching. *Research in Social Sciences and Technology*, *1*(1). https://doi.org/10.46303/ressat.01.01.3

Kim, C. (2020). Effects of creative convergence class of design thinking on improving university students' creativity confluence competency and problem-solving ability. *Asia-Pacific Journal of Educational Management Research, 5*(3), 33–40. https://doi.org/10.21742/ajemr.2020.5.3.03

Kim, D., & Li, M. (2021). Digital storytelling: facilitating learning and identity development. *Journal of Computers in Education, 8,* 33–61. https://doi.org/10.1007/s40692-020-00170-9

Kim, H. J., Park, J. H., Yoo, S., & Kim, H. (2016). Fostering creativity in tablet-based interactive classrooms. *Journal of Educational Technology & Society, 19*(3), 207–220. https://www.jstor.org/stable/jeductechsoci.19.3.207

Kozmus, A. & Kaučič, S. (2022). For creative students, we need creative teachers: The views of Slovenian primary school teachers on promoting creativity in the classroom. *International Journal of Education Humanities and Social Science, 5*(5), 78–91. https://doi.org/10.54922/IJEHSS.2022.0441

Kumi-Yeboah, A., Sallar, A.W., Kiramba, L.K., & Kim., Y. (2020). Exploring the use of digital technologies from the perspective of diverse learners in online learning environments. *Online Learning, 24*(4), 42–63. https://doi.org/10.24059/olj.v24i4.2323

Lamanauskas, V., Šlekienė, V., & Ragulienė, L. (2010). Lithuanian students` experiences with technology: Some important issues. *Problems of Education in the 21st Century, 22*, 64–75. http://oaji.net/articles/2014/457-1400515635.pdf

Lee, J. (2024). Latent class profiles of teacher use of digital tools in PISA 2018 data. *Education and Information Technologies, 29*(10), 12229–12261. https://doi.org/10.1007/s10639-023-12305-3

Leys, C., Klein, O., Dominicy, Y., & Ley, C. (2018). Detecting multivariate outliers: Use a robust variant of the Mahalanobis distance. *Journal of Experimental Social Psychology, 74*, 150–156. https://doi.org/10.1016/j.jesp.2017.09.011

Li, K. H., Meng, X. L., Raghunathan, T. E., & Rubin, D. B. (1991). Significance levels from repeated p-values with multiply-imputed data. *Statistica Sinica, 1*, 65–92. https://www.jstor.org/stable/24303994

Li, Y., Chen, D., & Deng, X. (2024). The impact of digital educational games on student's motivation for learning: The mediating effect of learning engagement and the moderating effect of the digital environment. *PLOS One, 19*(1), Article e0294350. https://doi.org/10.1371/journal.pone.0294350

Lin, C. (2023). Creative problem-solving ability does not occur by chance: Examining the dynamic system model of creative problem solving ability. *Gifted Education International, 39*(2), 168–182. https://doi.org/10.1177/02614294221149478

Lucas, B. (2022). *Creative thinking in schools across the world: A snapshot of progress in 2022.* Global Institute of Creative Thinking.

Lucas, B., & Spencer, E. (2017). *Teaching creative thinking: Developing learners who generate ideas and can think critically*. Crown House Publishing.

McDonald, J. K., West, R. E., Rich, P. J., & Hokanson, B. (2020). Instructional design for learner creativity. In M.J. Bishop, E. Boling, J. Elen, & V. Svihla (Eds.), *Handbook of research in educational communications and technology* (pp. 375–399). Springer. https://doi.org/10.1007/978-3-030-36119-8_17

McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey J. J., & Katherine B. (2016). Teaching in a digital age: How educators use technology to improve student learning. *Journal of Research on Technology in Education, 48*, 194–211. https://doi.org/10.1080/15391523.2016.1175856

Micheli, M. (2015). What is new in the digital divide? Understanding internet use by teenagers from different social backgrounds. In L. Robinson, S. R. Cotton, J. Schulz, T. M. Hale, & A. Williams (Eds.), *Communication and information technologies annual: Vol. 10*, (pp. 55–87). Emerald Group Publishing Limited. https://doi.org/10.1108/S2050-206020150000010003

Moorhouse B. L. (2021). Beginning teaching during COVID-19: Newly qualified Hong Kong teachers' preparedness for online teaching. *Educational Studies, 50*, 1–17. https://doi.org/10.1080/03055698.2021.1964939

Naharia, O., Wullur, M., & Modigir, N. (2024). The role of digital technology to enhance creativity and innovation skills for learners in the 21st century era. *Eduvest - Journal of Universal Studies*, *4*(10), 9646–9653. https://doi.org/10.59188/eduvest.v4i10.38826

Nannicini, T. (2007). Simulation-based sensitivity analysis for matching estimators. *The Stata Journal: Promoting Communications on Statistics and Stata, 7*(3), 334–350. https://doi.org/10.1177/1536867x0700700303

Ng, W. (2015). *New digital technology in education: Conceptualizing professional learning for educators.* Springer.

OECD (2019). *PISA 2021 creative thinking framework*. OECD Publishing.

OECD (2021). *Beyond academic learning*. OECD Publishing. https://doi.org/10.1787/92a11084-en

OECD (2022). *Thinking outside the box: The PISA 2022 creative thinking assessment*. OECD Publishing.

OECD (2023). *PISA 2022 results (Volume I): The state of learning and equity in education*. OECD Publishing. https://doi.org/10.1787/53f23881-en

OECD (2024a). *PISA 2022 technical report.* OECD Publishing. https://doi.org/10.1787/01820d6d-en

OECD (2024b). *PISA 2022 results (Volume III): Creative minds, creative schools*. OECD Publishing. https://doi.org/10.1787/765ee8c2-en

Orakcı, Ş. (2025). Autonomous learning and creative cognition: The mediating effect of gifted students' self-efficacy. *Frontiers in Psychology, 15*, Article 1301528. https://doi.org/10.3389/fpsyg.2024.1301528

Pifarre, M. (2019). Using interactive technologies to promote a dialogic space for creating collaboratively: A study in secondary education. *Thinking Skills and Creativity, 32*, 1–16. https://doi.org/10.1016/j.tsc.2019.01.004

Pikhart, M., Habeb Al-Obaydi, L., & Klimova, B. (2024). Does digital learning stimulate creativity? *Cogent Arts & Humanities, 11*(1), 1–9. https://doi.org/10.1080/23311983.2024.2407103

Pinto, M., & Leite, C. (2020). Digital technologies in support of students learning in higher education: Literature review. *Digital Education Review, 37*, 343–360. https://doi.org/10.1344/der.2020.37.343-360

Poupard, M., Sauzéon, H., André, T., & Larrue, F. (2023). A systematic review of immersive technologies for education: Effects of cognitive load and curiosity state on learning performance. https://doi.org/10.35542/osf.io/q7tup

Powell, M. G., Hull, D. M., & Beaujean, A. A. (2019). Propensity score matching for education data: Worked examples. *The Journal of Experimental Education, 88*(1), 145–164. https://doi.org/10.1080/00220973.2018.1541850

Prodani, R., Çobani, S. Andersons, A., & Bushati, J. (2022). Digital technologies integration in the classroom. A teacher's perspective. *Cypriot Journal of Educational Science, 17*(8), 2823–2837. https://doi.org/10.18844/cjes.v17i8.7781

Ramalingam, D., Anderson, P., Duckworth, D., Scoular, C., & Heard, J. (2020). *Creative thinking: Definition and structure.* Australian Council for Educational Research. https://research.acer.edu.au/ar_misc/43

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Sage.

Reinhart, J. M., Thomas, E., & Toriskie, J. M. (2011). K- 12 teachers: Technology use and the second level digital divide. *Journal of Instructional Psychology, 38*(3), 181–193. https://www.proquest.com/scholarly-journals/k-12-teachers-technology-use-second-level-digital/docview/1015179579/se-2

Ren, W., Zhu, X., & Yang, J. (2022). The SES-based difference of adolescents' digital skills and usages: An explanation from family cultural capital. *Computers & Education, 177*, Article 104382. https://doi.org/10.1016/j.compedu.2021.104382

Ridgeway, G., Kovalchik, S. A., Griffin, B. A., & Kabeto, M. U. (2015). Propensity score analysis with survey weighted data. *Journal of Causal Inference, 3*(2), 237–249. https://doi.org/10.1515/jci-2014-0039

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55. https://doi.org/10.1093/biomet/70.1.41

Rubin, D. B. (1997). Estimating causal effects from large data sets using propensity scores. *Annals of Internal Medicine, 127,* 757–763. https://doi.org/10.7326/0003-4819-127-8_part_2-199710151-00064

Rubin, D. B. (2001). Using propensity scores to help design observational studies: Application to the tobacco litigation. *Health Services and Outcomes Research Methodology, 2*, 169–188. https://doi.org/10.1023/A:1020363010465

Rubin, J. (2012). Technology's impact on the creative potential of youth. *Creativity Research Journal*, *24*(2–3), 252–256. https://doi.org/10.1080/10400419.2012.677370

Sarkar, B. (2023). Digital technology in education for the teaching and learning process of 21st century. In D.

S. K. Baskey, A. Roy ve D. Ray (Eds.), *Educational technology: Vision 21st century* in (pp. 87–94). Redshine Publication.

Selwyn N. & Aagaard, J. (2020). Banning mobile phones from classrooms-an opportunity to advance understandings of technology addiction, distraction and cyberbullying. *British Journal of Educational Technology, 52*, 8–19. https://doi.org/10.1111/bjet.12943

Tang, C., Mao, S., Naumann, S. E., & Xing, Z. (2022). Improving student creativity through digital technology products: A literature review. *Thinking Skills and Creativity*, *44*, Article 101032. https://doi.org/10.1016/j.tsc.2022.101032

Torrance, E. P. (2018). *The Torrance tests of creative thinking: Norms and technical manual.* Scholastic Testing Service.

Tusiime, W., Johannesen, M., & Guðmundsdóttir, G. (2019). The dilemma of teaching with digital technologies in developing countries: Experiences of art and design teacher educators in Uganda. *Nordic Journal of Comparative and International Education, 3*(2), 55–71. https://doi.org/10.7577/njcie.3313

Verardi, V., & Dehon, C. (2010). Multivariate outlier detection in Stata. *The Stata Journal: Promoting Communications on Statistics and Stata, 10*(2), 259–266. https://doi.org/10.1177/1536867x1001000206

Vilarinho-Pereira, D. & Fleith, D. (2021). Creative use of information and communication technologies according to university professors and students, 38. *Estudos De Psicologia (Campinas)*. https://doi.org/10.1590/1982-0275202138e190164

Wang, C., Chen, X., Yu, T., Liu, Y., & Jing, Y. (2024). Education reform and change driven by digital technology: A bibliometric study from a global perspective. *Humanities and Social Sciences Communications, 11*, Article 256. https://doi.org/10.1057/s41599-024-02717-y

Wang, B. & Li, P. (2024). Digital creativity in STEM education: The impact of digital tools and pedagogical learning models on the students' creative thinking skills development. *Interactive Learning Environments, 32*(6), 2633–2646. https://doi.org/10.1080/10494820.2022.2155839

Wu, M., Siswanto, I., & Ko, C. (2017). The influential factors and hierarchical structure of college students' creative capabilities–An empirical study in Taiwan. *Thinking Skills and Creativity, 26,* 176–185. https://doi.org/10.1016/j.tsc.2017.10.006

Yalcinalp, S., & Avci, Ü. (2019). Creativity and emerging digital educational technologies: A systematic review. *Turkish Online Journal of Educational Technology-TOJET, 18*(3), 25–45.

Yang, S., Zhu, S., Yang, H. H., Zhang, D., & Xu, S. (2024). Is creative thinking really teachable? A metaanalysis based on 64 experimental or quasiexperimental studies. *2024 International Symposium on Educational Technology (ISET)*, 284–289. https://doi.org/10.1109/ISET61814.2024.00063

Zaremohzzabieh, Z., Ahrari, S., Abdullah, H., Abdullah, R., & Moosivand, M. (2024). Effects of educational technology intervention on creative thinking in educational settings: A meta-analysis. *Interactive Technology and Smart Education, Vol. ahead-of-print.* https://doi.org/10.1108/itse-11-2023-0224

Zhang, J.-H., Liu, G.-R., Shi, W.-W., & Fu, X.-J. (2011). On the relationship between motivating style and elementary students' creative thinking: The mediating role of autonomous motivation. *Acta Psychologica Sinica, 43*(10), 1138–1150.

Zhong, X., Qu, K., & Zhang, D. (2024). Examining influencing factors of teacher education students' creativity in Chongqing municipality. *Cogent Education, 11*(1), Article 2351268. https://doi.org/10.1080/2331186X.2024.2351268

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PROSPECTIVE TEACHERS' AND SCHOOL COUNSELORS' EXPECTATIONS OF MATTERING IN THE SCHOOL ENVIRONMENT: PERCEIVED SUPPORT AND PROFESSIONAL MOTIVATION

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Abstract

Mattering is the personal perception of individuals that they are valuable for others and that they make a difference in the lives of others. Mattering affects the sense of belonging at work, motivation, and job satisfaction. This study aims to determine prospective teachers' and prospective school counselors' expectations regarding the extent to which they will matter to students, parents, colleagues, and administrators after they start working. The study adopted a qualitative approach and was designed as a case study. The data collected from 57 prospective teachers and school counselors from different disciplines were analyzed using the content analysis method. Participants expect to matter as they have an effective teaching and counselling attitude towards their students and as they have good communication with parents. They also expect to matter to their colleagues as they are simply colleagues and work in collaboration, and they expect to matter to their administrators as they have an idealistic learning attitude and contribute to the school. Participants who expect not to matter to students and parents list the reasons as prejudices against their discipline and negative attitudes towards teachers. Similarly, there are also participants who state that they do not matter because of their colleagues' prejudices against their discipline and the indifference of their administrators. The study revealed that the general sense of mattering they feel in the school environment positively affects their professional motivation, and that in case of anti-mattering, they continue their profession by finding alternative routes.
Keywords: *expectation of mattering, prospective teachers, anti-mattering, school counselors*

Introduction

Choosing a profession is one of the most important decisions an individual ever makes. Teaching is one of the popular professions in Türkiye (The Council of Higher Education [CoHE], 2024). The reasons why prospective teachers choose the teaching profession are commonly grouped into three categories: intrinsic, extrinsic, and altruistic motivations (Kılıç, 2022). Intrinsic reasons include a love of learning and teaching, considering teaching an ideal career, the belief that one has the characteristics required for the profession, and an affection for children. Among the extrinsic reasons are the profession's status, monthly income it offers, working conditions, job security, and its frequent recommendation by others. As for altruistic reasons, the list includes the perception of teaching as a valuable profession, the individual's desire to make a difference in teaching and be a role model, and the need for competent teachers in the education system (Çakmak & Kayabaşı, 2017; Kılıç, 2022; Özsoy et al., 2010; Tünkler, 2021). Another popular profession in Türkiye is psychological counseling. Guidance and psychological counseling (GPC) department is under the roof of the faculty of education in universities, and graduates of this program usually get a job in public schools (Asarlı &

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Külahoğlu, 2022; Görgülü & Demirtaş Zorbaz, 2024; Uğur et al., 2023). The graduates work in schools as "school counselors" (Ministry of National Education [MoNE], 2020). The Guidance and Psychological Counseling (GPC) program ranks among the top three choices of students in the university entrance exam. Some students designate the GPC program as their sole preference, and their families often support these decisions (Bacanlı&Aslan, 2020). The reasons for choosing GPC include the compatibility of one's personality traits with the characteristics required by the GPC program, desire to help people, and the wide range of employment opportunities the GPC program offers. In this context, intrinsic, extrinsic, and altruistic reasons can be listed among the reasons leading students to choose GPC as a profession (Uğur et al., 2023).

One of the factors positively affecting the intrinsic and altruistic motivations of prospective teachers and prospective school counselors is the perception of mattering. Mattering is defined as the feeling that people experience when they feel that others care about them and value their contributions (Rosenberg & McCullough, 1981). Mattering gives individuals a sense of being emotionally and cognitively connected to someone special, makes their lives meaningful, provides them with a purpose, and boosts their psychosocial health (Marshall, 2001). Therefore, mattering is a fundamental need (Dixon Rayle, 2006). An individual evaluates mattering to others by considering four sub-factors; (1) whether their actions are noticed by others (attention), (2) whether others make them feel valued (importance), (3) whether people consider their personal interests when acting (reliance), and (4) whether people are emotionally invested in them (ego-extension) (Rosenberg& McCullough, 1981). Sometimes, even though all of these components are in place, individuals may still feel that they do not matter to others. Therefore, the perception of goodwill in behavior is more important than the actual act of mattering (Elliott et al., 2004). Individuals need to know whether others think about them, care about them, seek their help or advice, or will care about them when needed. While an unfulfilled sense of mattering leads individuals to question their existence (Elliott et al., 2004), fulfilling this need is important for their well-being (Taylor & Turner, 2001).

Teachers face various challenges in the first year of their profession and while developing teaching skills (Çakmak et al., 2018). Novice school counselors who struggle with the challenges of school counseling need support regarding personal and professional aspects. Mattering is relevant for the personal and professional needs of school counselors and therefore deserves an in-depth examination (Curry & Bickmore, 2012). The transition from school to work is a difficult phase in the life of a professional (Öztürk & Yıldırım, 2013). The perception of mattering is important not only for students' achievement and well-being but also for both in-service (Campbell, 2016) and prospective teachers. Teachers with a sense of mattering feel that they make a difference in the world (Flett, 2018). Studies indicate that teachers whose psychological needs are not met in the school environment experience higher levels of burnout (Van den Broek et al., 2008), while those who are content with their workplace experience higher job satisfaction (Birkholz & Wininger, 2013). It has also been identified that teachers with positive emotions had healthier relationships with principals (Gareis & Tschannen-Moran, 2015), other teachers (Guzman &Viernes, 2005), and students (Klassen et al., 2012). Similarly, Curry and Bickmore (2012) have found that supportive management and collaborative relationships with students and other stakeholders played a key role in making school counselors feel that they matter.

Research Aim

In Türkiye, education faculties offer four-year programs. GPC programs are under the roof of the Faculty of Education. Graduates of the GPC program work as school counselors in schools (Ministry of National Education [MoNE], 2020). All senior students of the faculty of education have internships in schools during the fall and spring semesters. Internship allows

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them to put the theoretical information into practice and affects the attitudes and motivations of prospective teachers towards their profession (Şengül Bircan, 2024). During the internship, prospective teachers observe the courses, prepare plans, and teach the courses, and prospective school counselors work in the school GPC service to support the social, emotional, academic, and career development of students. During this process, they gain insights into the school climate, engage in frequent communication with students, and observe the extent to which teachers in their discipline matter to students, parents, other teachers, and administrators. The review of the national literature has revealed that existing studies focus on topics such as self-efficacy beliefs and attitudes toward the teaching profession (Demirtaş et al., 2011), perceptions of communication skills (Pehlivan, 2005), lifelong learning tendencies (Tunca et al., 2015), perceptions of distance education (Başar et al., 2019), and perception of teachers (Atabek-Yiğit & Balkan-Kıyıcı, 2019). However, studies focusing on prospective teachers' perception or expectation of mattering are missing. Similarly, although the national literature has delved into topics such as the self-efficacy perceptions of prospective school counselors regarding GPC services in special education (Derin Kılıç & Er, 2021), professional dedication and regrets (Tunç & Tunç, 2022), emotional awareness levels (Gençtanırım Kurt et al., 2015), and personal inclination to the profession (Korkut Owen & Tuzgöl Dost, 2020a), no study has been conducted on the perception of mattering by prospective school counselors. However, various groups, especially key stakeholders in the field of education, such as students, parents, colleagues, and school administrators, play an important role in shaping teachers' perceived sense of mattering (Gaudreault et al. 2018). Prospective teachers tend to develop a sense of belonging as a result of mattering (Strayhorn, 2012). Similarly, Rayle (2006) has indicated a relationship between school counselors' perception of mattering to others at work and job stress and job satisfaction. Accordingly, understanding prospective teachers' expectations concerning their perceived sense of mattering was considered a significant area of inquiry.

This study has two main objectives:

1. To determine the expectations of prospective teachers and prospective school counselors regarding the extent to which they matter to students, parents, colleagues, and administrators.
2. To determine the views of prospective teachers and prospective school counselors regarding how their expectations of mattering by school stakeholders affect their professional motivation.

Research Methodology

Model

This study was conducted to determine the expectations of prospective teachers and prospective school counselors regarding the extent to which they matter to stakeholders in the school environment and how these expectations may affect their professional motivation. The study used a case study design, one of the qualitative research methods. Qualitative research aims to observe phenomena in their natural environment and to present the findings in a holistic way, without distortion (Yıldırım&Şimşek, 2013). A case study examines what is actually happening in the environment, collects and analyzes data systematically, and presents the results (Davey, 2009). Prospective teachers and prospective school counselors made observations and practices in different schools for two semesters and had observations regarding their relationships with stakeholders in the school. Based on these experiences, they have developed an expectation regarding how mattering or anti-mattering they perceive in their relationships with stakeholders in the school environment as teachers/school counselors may affect their professional motivation. The study attempted to determine these expectations in detail by using a semi-structured questionnaire.

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Study Group

The study group consisted of volunteer senior students enrolled in a teacher training program at a university in the Western Black Sea Region, all of whom had completed the "School Practices" course. Maximum variation sampling, one of the purposive sampling methods, was used to form the study group. To achieve maximum variation, the views of students from all teacher training programs were included in the study. 60 prospective teachers and school counselors volunteered to participate in the study; however, the answers of 3 students (male GPC, female Science, male Physical Education) were found insufficient in the initial analysis and excluded, reducing the number of participants to 57. The participants were initially coded according to their disciplines (e.g., English Teaching, GPC), and then by gender (female-F, male-M).

Characteristics of the prospective teachers and school counselors included in the study group are presented in Table 1.

Table 1
Characteristics of the Participants

Variable		***n***	***%***
Sex	Female	35	61
	Male	22	39
Department	Science	9	16
	Mathematics	6	11
	Turkish	3	05
	GPC	10	18
	Social Sciences	7	12
	English Teaching	5	09
	Physical Education	7	12
	Islamic Studies	7	12
	Art	3	05
	Total	57	100

When Table 1 is examined, it is seen that 32 out of 57 participants are female (61%), and 22 are male (39%). 9 (16%) of the participants study Science, 6 (11%) study Mathematics, 3 (05%) study Turkish, 10 (18%) study Guidance and Psychological Counselling, 7 (12%) study Social Sciences, 5 (9%) study English Teaching, 7 (12%) study Physical Education, 7 (12%) study Islamic Studies, and 3 (05%) study Art.

Data Collection Tool

Four items of the School Counselors Mattering Scale (SCMS), developed by Dixon-Rayle (2006), regarding students, parents, other teachers, and administrators, were adapted into open-ended questions. In addition, a five-item interview form was developed by adding another question not included in the SCMS. The scale items did not include a statement specifically aimed at determining the school counselors' perception of mattering. Therefore, the scale items were formulated as open-ended questions and were used to determine all prospective teachers' and prospective school counselors' perception of mattering. A consent form was included on the

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first page of the data collection tool. The form introduced the purpose of the study, clarified that the study was unrelated to participants' courses, and that participation was entirely voluntary.

To evaluate the relevance of the questionnaire for the purpose of the study, a GPC specialist and an Assessment and Evaluation expert experienced in qualitative studies were asked for their opinions. This process aimed to ensure the internal validity of the study (Yıldırım & Şimşek, 2013). A pilot study was conducted with two volunteer students from different departments (Mathematics and GPC) to test the comprehensibility and relevance of the questions. In the pilot study, the students stated that they found the questions clear and understandable but recommended that the purpose of the study be explained in the consent form, and that a reminder be included to ensure that participants do not take the questions personally but respond from the perspective of their discipline. In line with this feedback, the questionnaire was finalized, and the actual study was conducted.

Data Collection

First, ethical approval was obtained from the Social and Human Sciences Ethics Board of the university where the researcher was employed. Then, upon approval of the course instructors, classes were visited, students were introduced to the study and informed about its purpose and scope. Open-ended questions, turned into a Google form, were shared with the students through class representatives and academic advisors of the courses. Students volunteering to participate in the study were asked to answer the questions. They were asked to read the questions carefully and answer them sincerely and clearly. Participants were able to proceed to the questions after approving the voluntary participation statement on the first page of the Google Form. No personal information other than their gender and department was requested. It was clearly stated that their participation in the study or their withdrawal from it would not affect their courses or course grades. The data was collected in May-June 2024. The data collected are kept in line with the principles of research ethics.

Data Analysis

The data were analyzed using the content analysis method, which determines the frequency of written and spoken expressions in accordance with the guidelines prepared (Aziz, 2011). It aims to capture the concepts that will describe and explain the data collected. Accordingly, first the data is coded and conceptualized, then the relationships between these codes are identified and themes are created, and finally the findings are interpreted (Yıldırım & Şimşek, 2005). The data analysis of the study was carried out by two independent experts experienced in the qualitative study process. The codes and themes independently generated by the experts were compared, and a consensus was reached on the common codes and themes. Intercoder reliability was calculated using Miles and Huberman's (1994) formula (Reliability = Agreement/ Agreement +Disagreement), and the reliability coefficient was found to be .85.

Guba and Lincoln (Guba & Lincoln, 1981; Lincoln & Guba, 1985 as cited in Spencer & Ritchie, 2012) emphasized the need for credibility in qualitative research and identified four basic criteria, namely credibility, reliability, confirmability, and transferability. Creswell (2018) also stated that methods such as long-term interaction, peer review, and triangulation contribute to the credibility of qualitative research. The extension of the interaction between the researcher and the data source over a long period of time increases the credibility of the research data (Yıldırım&Şimşek, 2013). Since the researcher visited the classes and provided information about the research process while teaching in teacher training departments, it can be stated that the researcher and the students had a longitudinal relationship in this study. In addition to the researcher, the data were examined and analyzed by another expert, thus ensuring a peer review. Samples from the participants' views were presented to ensure credibility.

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Research Results

In Table 2, the expectations of participants regarding the extent they matter to their students were grouped under three themes: participants matter to students, participants do not matter to students, and participants partially matter to students.

Table 2
The Expectations of Participants Regarding the Extent They Matter to Students

Theme	Sub-theme	*n*	*f*
	Effective teacher	30	ENGM2, ENGF2, ISM4, ISF7, ISM6, ISF8, PEF9, PEM9, PEM10, PEF11, PEF12, MF13, MM11, MM13, SSF15, SSM14, SSM16, GPCM16, SF21, ArtM20, GPCF24, SF26, SF27, GPCF28, SF30, SF31, SF32, SM21, SM22, SSF33
Matter	Discipline is important	10	ENGF1, TF6, PEM8, PEF10, MF14, GPCM17, GPCF18, GPCF19, GPCF20, GPCF23
	Teacher	3	ISF5, ISM7, MF25
	Young teacher	2	MM12, PEF17
Do not matter	Discipline	4	GPCM19, ArtF22, SSF34, ArtF35
	Attitude towards teacher	2	ENGM1, ENGF3
Partially matter	Inexperienced teacher	1	TM3
	Student profile	3	TF4, ISM5, SF29
	Discipline	3	SSF16, GPCM18
Total		57	

ENG: English, T: Turkish, IS: Islamic Sciences, PE: Physical Education, Art: Art, M: Mathematics, S: Science, GPC: Guidance and Psychological Counselling, SS: Social Sciences

Under the theme of "participants matter to students", 30 participants stated that they would matter because of their effective teaching attitude, 10 participants stated that their discipline is considered important by students, 3 participants stated that they would matter as they are colleagues, and two participants stated that they would matter because they are young teachers. Under the theme of "participants do not matter to students", 4 participants stated that their discipline is not considered important. Two participants stated that they would not matter because of the attitude towards the teacher. Under the theme of "participants partially matter to students", three participants stated that they have such an expectation because of their student profile and discipline, and one participant stated that he/she has such an expectation because they are considered inexperienced.

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Examples of participants' views that they matter to students are presented below.

- I think I will be highly valued because the methods I use during my courses will draw my students' attention, and my interaction with them will be positive (SF21).
- Since my discipline is mathematics, and it is an important course, I expect students to value me highly (MF14).
- I am aware that my profession has been gaining importance recently. I have also seen that school counselors are highly valued by students in the places where I had my internship and that students visit their school counselors freely (GPCF19).
- Due to my discipline, I think I will be valued the most compared to other disciplines because Turkish is a course that students will use throughout their lives, whether in school or at work. It is also the course with the highest weight in exams and where the highest threshold is set to pass the course (TF6)
- I will be highly valued. Because children are always very interested in sports (PEM8)
- Considering that teachers are role models, I expect to be highly valued because we are even the heroes of some students (SF27)

Examples of participants' views that they do not matter to students are presented below.

- I think I will matter very little. Because respect for teachers is decreasing day by day, and students no longer respect teachers (ENGM1)
- Students generally value teachers of basic subjects more. Since they do not care much about English and most students will not be asked to answer English questions in the university exam, I can say that they do not value their teachers at all (ENGF3)
- As a social sciences teacher, I do not think we will matter a lot, the reason for this is my observations... They care more about subjects like mathematics and Turkish (SSF34)
- I think I will be considered as teaching a "useless subject" for students who are not interested in art. When I think back to my youth, art courses were considered fun in primary school and an easy way to earn grades in secondary school. I studied fine arts in high school, but if it had been in another high school, it would be a course used to do a test (ArtF35).

Examples of participants' views that they do partially matter to students are presented below.

- I do not think we will matter at all to students when we start working as they consider us inexperienced (TM1)
- I do not think they will value us a lot as I am not a math or science teacher (SSF16)
- I do not think we will matter at all. Teachers and psychological support staff do not matter at all in our country (GPCM19).

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Table 3
The Expectations of Participants Regarding the Extent They Matter to Parents

Theme	Sub-theme	*n*	*f*
	Communication with parents	15	ENGM2, ISM7, PEF9, PEF10, PEM9, PEF11, PEF12, MF13, SSF15, SSM14, SSM15, GPCM16, ArtM20, SF26, SF31
Matter	Conscious parent	10	TF4, GPCM17, GPCF18, GPCF 23, MF25, FF27, GPCF 28, SF30, SM22, SSF34
	Discipline is important	8	ENGF1, ENGF3, TF6, MM13, MF14, GPCM18, SF29, SF32
	Impact of the student	6	ENGF2, PEM10, GPCF20, SF21, GPCF 24, SM21
	Teacher	2	SSM4, SSF5
Do not matter	Discipline	5	PEM8, SSF16, GPCM19, SSF33, ArtF35
	Attitude towards teacher	2	ENGM1, GPCF19
	Inexperienced	2	TM3, ISF7
Partially matter	Attitude of parents	4	ISM6, ISF8, MM11, SSF17
	Discipline	2	ArtF22, ISM5
	Student profile	1	MM12
Total		57	

As it is observed in Table 3, the expectations of participants regarding the extent they matter to parents were grouped under three themes: they matter to parents, they do not matter to parents, and they partially matter to parents. Under the theme of "they matter to parents", 15 participants stated that they would matter as they would have good interaction with parents, 10 participants stated that they would matter as parents are conscious, 8 participants stated that they would matter as their disciplines would be considered important by parents, 6 participants stated that they would matter due to impact of students and two participants stated that they would matter simply because they are colleagues. Under the theme of "they do not matter to parents", 5 participants stated that their disciplines would be considered unimportant, and two participants stated that they would not matter as they would be considered inexperienced and because of their attitude towards teachers. Under the theme of "they partially matter to parents", 4 participants expected that they would matter partially because of parents' attitudes, 2 participants stated that they would matter because of their disciplines, and one participant stated that he/she would matter partially because of the student profile.
Examples of participants' views that they matter to parents are presented below.

- Parents generally have little contact with teachers, but when they do, they will respect me and value my ideas thanks to my sincerity and good communication skills (ENGM2)
- I think I will matter a lot to parents. Because I will be the person students can talk to about their psychological mood and academic success (GPCM18)

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- I think English teachers are highly valued by parents. Every parent wants their child to learn English more or less and improve themselves in terms of language. For these reasons, they value the contribution of English teachers to students (ENGF3)
- I expect to be valued at least to the extent of the positive relationship between me and my students (SM21)
- I think I will matter greatly to parents. Since science is an important subject for high school and university entrance exam, parents value this subject (SF32)

Examples of participants' views that they do not matter to parents are presented below.

- Parents do not value at all as they consider physical education course useless (PEM8)
- Except for conscious parents, it is always considered an unnecessary course. It is inevitable for me to see reactions such as "will they grow up to be artists, what's the point of drawing pictures", and "how can such a nonsense course have grades" if a student gets low marks (ArtF35)
- I think parents see themselves as superior to teachers. Therefore, I think many of them will not value [us](GPCF19)
- Parents may consider me inexperienced because I am a new graduate. They may not value [us] much (ISF7)

Examples of participants' views that they partially matter to parents are presented below.

- I am not sure. The reason is that there are various types of parents (MM11).
- I think I will partially matter to parents. Social sciences course is not valued as much as mathematics or Turkish (SSF33).
- We are followed closely by some conscious parents, but in general, numerical and verbal courses have priority in Turkish society (ArtF22).
- I think we will matter in proportion to the needs of the students. Parents of students who do not have expectations and desires will not value us at all, and we may not have much contact (MM12).

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Table 4
The Expectations of Participants Regarding the Extent to Which They Matter to Other Teachers

Theme	Sub-theme	*n*	*f*
Matter	Colleagues	13	ENGM1, ENGM2, ENGF2, ENGF3, ISM4, ISF5, TF6, PEM8, MM12, SSF16, ArtF22, SM21, PEF33
	Collaboration	13	ISM6, PEM9, PEM10, PEF12, SSF15, SSM14, GPCF19, TF4, GPCF20, ArtM20, SF26, GPCF28, SM22
	Effective teacher	4	ENGF1, PEF9, SF21, GPCF24
	Workload	3	TM3, PEF34, PEF11
	New appointment	1	MF14
Do not matter	Prejudice	2	PEF10, GPCF23
Partially matter	Attitude	8	SSM15, GPCM19, SF30, SF31, ArtF35, SF1 MF13, GPCM17
	Prejudice	5	GPCM16, GPCM 18, MM11, MF25, MM11
	Inexperienced	3	SSF7, MM13, SF29
	Routinization	2	SSF17, SF27
	Collaboration	1	ISM5
OTHER		2	SF32, ISF8
Total		57	

When Table 4 is examined, it is seen that the participants' expectations of mattering to other teachers were gathered under four themes as they matter to other teachers, they do not matter to other teachers, they partially matter to other teachers, and other. Under the theme of "they matter to other teachers, 13 participants stated that they expect to matter because they are colleagues, 13 participants stated they expect to matter as they will collaborate, 4 participants stated that they expect to matter as they will be effective teachers, 3 participants stated that they expect to matter as they will share the workload of other teachers and one participant stated that he/she expects to matter since they will be newly appointed. Under the theme of "they do not matter to other teachers", two participants stated that they think they will not matter because of prejudices. Under the theme of "they partially matter to other teachers", 8 participants stated that they expect to matter partially because of attitude, 5 participants stated that they expect to matter partially because of prejudice, 3 participants stated that they expect to matter partially because of inexperience, 2 participants stated that they expect to matter partially due to routinization of meeting new teachers and one participant stated that he/she expects to matter partially as they will collaborate. The opinions of two participants could not be put under any theme and therefore were designated as "other". Examples of participants' views that they matter to other teachers are presented below.

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- Everyone is valuable regardless of their discipline, and everyone cares about each
- other (SSF16).
- Teachers from other disciplines have repeatedly stated that they have difficulty with changing student profile. They need us for collaboration. Therefore, I think 90% of them will value [us](GPCF19).
- I think that I will matter greatly as I am competent in my profession (SF21).
- I think that I will matter not only because I have mastered the foreign language, but also because of my skills in the field of education and my commitment to self-improvement (ENGF1).
- I think that we will have a heavier workload compared to other teachers in the school and that we will become individuals who take on the work of teachers in a way (TM3).

Examples of participants' views that they do not matter to other teachers are presented below.

- If you are different, you are not loved (PEF10)
- Because even while we were studying at university, our friends in other departments had a negative attitude towards school counselors. Everyone thought that standard counselors do nothing in their offices, and the number of these people is quite high, and when these people start working in schools, their perspectives will not change (GPCF23).

Examples of participants' views on the fact that they partially matter to other teachers are presented below.

- I think we will be a bit excluded, especially by teachers who are close to retirement (MM13)
- I would say half and half. Generally, other than the group teachers, other teachers do not care much about each other (SF31)
- I do not think I will matter a lot to the other teachers at school. They may be prejudiced because I am newly appointed (ISF7)
- I know that other subject teachers have negative perceptions about school counselors. For this reason, I do not think I will matter a lot (GPCM18)
- I think I will matter partially because of the possibility that teachers may consult me to understand children (ISM5).

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Table 5
The Expectations of Participants Regarding the Extent They Matter to Their Administrators

Theme	Sub-theme	*n*	*f*
Matter	Idealist teacher	17	ENGF1, ENGM2, ENGF2, ISM4, TF4, ISM7, PEM10, PEF11, MF13, MM12, SSF15, SSM15, SF21, GPCF24, MF25, SF26, SF31
	Contribution to school	10	ISM5, ISM6, PEM8, PEM 9, GPCM16, GPCF19, GPCM 18, ArtM20, GPCF28, SSM34
	Discipline is important	8	TF6, SSF7, MM11, MF14, GPCM17, GPCF20, GPCM19, ArtF35
	Colleagues	7	ENGF3, ISF5, ISF8, PEF16, ArtF22, SM22, SSF33
	Empathy	3	ENGM1, MM13, SSF17
	Workload	3	TM3, SSM14, GPCF23
Partially	Indifference	3	SF27, SF30, PEF9,
	Inexperienced	1	SF29
	Prejudice	1	GPCF18
Other		4	PEF10, PEF12, SF32, SM21
Total		57	

It can be observed in Table 5 that the expectations of the participants to matter to their administrators were gathered under three themes: they matter to administrators, they partially matter to administrators, and other. Under the theme of "they matter to administrators", 17 participants stated that they expect to matter as they are idealistic, 10 participants stated that they expect to matter since they will contribute to the school, 8 participants stated that they expect to matter as their discipline is important, 7 participants stated that they expect to matter as they are colleagues and 3 participants stated that they expect to matter because of empathy and as they share the workload. Under the theme of "they partially matter to administrators", 3 participants stated that they have low expectations of mattering because of administrators' indifference, and 1 participant stated that they have low expectations of mattering because of their inexperience and others' prejudices. The views of 4 participants could not be included in any theme and were designated as "other". Examples of participants' views that they matter to their administrators are presented below.

- I think they will care about me 80% of the time. I am both hardworking and disciplined. I quickly adapt, so I do not think I will have a problem (SSF15).
- I hope they will take a new teacher seriously when he/she is idealistic and tries to do his/her job (MF25).
- The administrators will value me a lot because it is very important for them to take the school's sports success to the next level (PEM8).
- Maybe it may differ due to the weight of the course or the course for which the student is held responsible in central exams (TF6).
- I think the administrators' views are the same as the teachers', that is, they care about my discipline as much as they care about other teachers (ENGF3).

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- My administrators will care about me just like my other colleagues. I do not think that they will have a preference for certain subjects (SSF33).
- I think that administrators will be more careful because they are experienced (MM13).

Examples of participants' views that they partially matter to their administrators are presented below.

- When I am assigned as a science teacher, I do not expect to matter much to the administrators, as the majority have the attitude of "Just do your job, do not bother me" (SF30).
- Because I think some administrators consider it a useless profession (GPCF18).

Table 6
Views of the Participants on How This Expectation of Mattering Affect Them

Theme	Sub-theme	*n*	*f*
Mattering	Professional motivation	29	ENGF1, ISM3, ISF5, ISF7, ISM6, ISF8, PEF9, PEM8, PEM9, PEM10, PEF11, PEF 12, MF13, MF14, SSF16, SSM14, SSM15, GPCM16, GPCM19, ArtM20, GPCF23, GPCF24, SF26, SF27, GPCF 28, SF32, SM21, SM22, SSF33
	Personal development	2	ENGF1, SF21
	Productivity at work	2	TM3, SSF15
	Job satisfaction	1	GPCF19
Anti-mattering	Alternative route	8	TF4, MM11, SSF15, GPCM16, MF25, SF30, SSF34, ArtF35
	Negative feelings	6	ENGM1, MM12, ArtF22, ArtF35, GPCF 24, GPCM18
	Demotivation	4	ENGM2, SSF17, GPCF18, SF29
	Undermined ideals	4	ENGM2, ENGF3, TF6, ISM7
	Decrease in productivity at work	2	ENGF2, SSF15
Other		5	ISM5, PEF10, MM13, GPCM17, SF31
Total		63	

In Table 6, how the participants' expectations of mattering affect them were grouped under three themes: they matter, they do not matter, and other. Under the theme of mattering, 29 participants stated that mattering would increase their motivation for their profession, 2 participants stated that it would enhance their personal development and productivity at work, and one participant stated that it would increase their job satisfaction. Under the theme of "anti-mattering, 8 participants stated that they would find an alternative route, 6 participants stated that they would experience negative feelings, 4 participants stated that they would be demotivated, and their ideals would be undermined, and 2 participants stated that they would experience a decrease in productivity at work. The opinions of 5 participants were designated as "other". Examples of views on how expectations of anti-mattering affect participants are presented below.

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- Mattering to various stakeholders can positively affect my work and help me create a more successful educational environment (PEM9)
- Seeing that my work is valued affects my motivation for the job and increases my job satisfaction (GPCF19)

Examples of views on how expectations of not mattering affect participants are presented below.

- When I face these problems, I will solve them in the best way possible and move forward because I value and love this profession. That's why I will not give up (SSF15)
- However, I am aware that there will be times when I am not taken seriously. This will not demoralize me. As a workaholic, I will embrace my profession with all my heart and fulfill my duty in the most correct way (GPCM16).
- Whenever I am not taken seriously, this may affect me negatively, but since this will not continue like this, I can also find ways to get motivated (TF4).
- The biggest factor in choosing this profession was my fondness of students and being able to establish a good relationship with them. However, realizing how little I matter to the students and other teachers in my field makes me question whether I made a mistake by choosing this profession (ENGF3).
- Frankly, even the thought of not being taken seriously scares me because the possibility that a job that you will do for the rest of your life is not taken seriously will eventually make you lose interest in the profession (TF6).

Discussion

In Türkiye, prospective teachers and prospective school counselors have internships in schools during the last year of their education. The aim of this study was to determine the expectations of prospective teachers and prospective school counselors regarding the extent to which they matter to their stakeholders in schools based on the impressions and experiences they have gained during their internships and how these expectations affect their professional motivation. The study was designed employing a qualitative method, and data from 57 participants were analyzed.

Mattering to Students

The participants were asked about their expectations regarding the extent to which they would matter to students. The participants stated that they would matter to students because of their effective teaching attitude, the importance students attach to their subject areas, and simply because they are colleagues. The participants who described themselves as having an effective teaching attitude stated that they would use a variety of methods and techniques in their lessons, teach in line with the principle of learning by doing and experiencing, master technology, excel in classroom management, and have good interaction with students. Studies have shown that in addition to transferring knowledge, teachers are expected to perform various tasks such as utilizing technology, being open to cooperation, working with children with special education needs, and contributing to school management (Alp & Levent, 2020; Göker & Gündüz, 2017). The characteristics that an educator should have for effective classroom management and healthy communication are listed as personality traits such as patience, tolerance, friendliness, and professional skills such as communication skills, eagerness to learn, and research skills (Duman & Taş, 2021). It is vital that prospective school counselors have strong communication

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skills, love helping people, have high self-awareness, are psychologically healthy, are open to differences/innovations, and are committed to ethical principles (Korkut Owen & Tuzgöl Dost, 2020b). It can be said that prospective teachers and prospective school counselors think that they can live up to these expectations with the knowledge they have gained and thanks to the internship they have completed. This study revealed that the professional attitudes of prospective teachers from different disciplines and prospective school counselors were strong, which can be interpreted as their satisfaction with the education they received, that they can use the knowledge and skills they have acquired during an internship, and that their self-efficacy and self-confidence are high.

Prospective teachers who consider their subject area important emphasized the importance of knowing a foreign language. Participants from Turkish, Mathematics and Science disciplines mentioned the fact that their courses had more weight in exams. Participants from Physical Education and psychological counselling highlighted the students' interest in sports and the increasing importance attached to mental health. Those who emphasized being colleagues and being young teachers, believe that they can serve as role models and understand students more easily as their ages are closer to those of the students. Findings supporting this result have been reported by the studies conducted with prospective teachers from various disciplines. It has been revealed that prospective teachers of physical education, music, art, and social sciences have more positive attitudes towards the teaching profession compared to those in other disciplines (Sandıkçı, 2021). It is also observed that Turkish prospective teachers attribute high value to the teaching profession and have positive and high expectations of being successful in practicing the profession (Zırıh, 2023). In Türkiye, it is required to take an exam to study in high school (MoNE, 2014) and at university (ÖSYM, 2011). In order to be successful in exams, it is necessary to be successful in Turkish, Math, and Science courses. Furthermore, Turkish is a must course in secondary schools to pass to the next grade (MoNE, 2014). Therefore, prospective teachers in the fields of Turkish, Math, and Science expect to matter due to the exam system applicable in the country. It can be stated that the increasing dominance of English in daily language, the widespread use of technological tools, and the interest in physical education and sports due to the perception of sports as a profession as well as the successes in various sports disciplines, have strengthened the participants' expectations that their disciplines are valued. Prospective school counselors may think that their field of expertise is valued due to the increasing number of students seeking support from mental health specialists for problems such as adolescence-related challenges, exam anxiety, loneliness, and bullying.

Participants with the expectation of not mattering or partially mattering listed their reasons as their subject areas being considered unimportant, negative attitudes towards teachers, student profile, and being perceived as inexperienced. Prospective teachers and prospective school counselors stated that their expectations of mattering are low due to the decrease in societal respect for the teaching profession, students' lack of respect for teachers, being considered inexperienced, teaching subjects not included in the exam (English, Art), teaching verbal courses described as boring (Social Sciences) and the prejudices against those providing psychological services. This finding is supported by several studies in existing literature. A study conducted with teachers has demonstrated that respect for teachers decreased in society in recent years due to reasons such as laws and regulations, families, politicians, school administration, teachers, development of technology, and changes in the value judgments of society (Külünkoğlu, 2017). It has also been emphasized that students' learning behaviors, moral values , and views on social rules have changed due to the frequent use of digital tools, with these changes being largely negative (Alp & Levent, 2020). It can be stated that the value attributed to schools and teachers has decreased in line with technological advancements and changes in society's core values, and that students have also been affected by this process. Another factor that negatively affects prospective teachers' expectations to matter is exams.

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High school and university entrance exams are students' primary concern. Exams have fostered a competitive culture, bringing individualism to the fore (Keskin, 2012). This situation can be interpreted as students attaching more importance to the courses with more weight in the exams and to the teachers teaching these courses.

Mattering to Parents

The expectations of the prospective teachers and school counselors regarding the extent to which they matter to parents were asked. Participants expected to matter to parents because they would have effective communication with them and be valued by those who prioritize education and who regularly monitor their child's adaptation and success. They also expected to matter to parents because of their good interaction with students. The majority of prospective teachers believed that they would establish healthy communication with parents, and that they would deal with parents who considered learning a foreign language important, valued Math and Science courses due to their greater weight in exams and children's social and emotional development are regarded as equally important as their academic development. During their internship for a year, prospective teachers observed communication between parents and teachers and attended parent-teacher meetings. It can be stated that they expect to matter as a result of these experiences. On the other hand, prospective school counselors expressed their expectation to matter to parents due to their ability to establish effective communication with parents, the importance of their discipline, the belief that their quality communication with students would positively influence parents' views, as well as the expectation that they would matter especially to conscious parents. Parents are increasingly facing challenges in raising their children and seek support from school counselors to address these problems and support their children's adaptation. In this context, it can be inferred that prospective school counselors expect to matter to parents.

Those who expected not to matter or to partially matter to parents stated that their expectations resulted from their discipline being considered unimportant, negative attitudes towards teachers, their lack of experience, and the student profile. Especially prospective teachers of physical education, arts and social sciences noted that parents would be prejudiced against their disciplines and attach more importance to Math and Science courses due to their greater weight in exams. Moreover, they expected not to matter due to the changing parent profile, some parents' perception of being superior to teachers or viewing them as inexperienced, along with the fact that the parents of students with no academic goals and intention to study would not attend meetings with teachers or show concern for the educational process. This finding is consistent with the other findings in literature. The status of teachers in society is determined by factors such as teachers' salary, whether this salary is fair or not, how much parents want their children to be teachers, respect for teachers, and the degree of trust the society has in education systems (Varkey GEMS Foundation, 2013). The majority of prospective teachers think that the teaching profession is not respected by society (Polat et al., 2015). In a study conducted by the Varkey Foundation, data from 2013 were compared with data from 2018, and it was identified that Türkiye ranked third among the countries where teachers experienced the greatest decline in status over the past five years (Euronews, 2018). Teachers believe that since 2005, parents have increasingly interfered in the functioning of schools, become overprotective, glorified themselves through their children, acted inconsiderately, and shown less trust in teachers (Ünsal et al., 2022). In societies that prioritize material income and status over education and fail to respect expertise, education and educators do not get the value they expect. At the same time, the lack of awareness among parents makes it difficult to show teachers the respect and value they deserve. Some prospective teachers stated that they did not matter as their discipline was not considered important by students and parents. Studies have shown that subject areas had

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different status levels in the professional environment of schools (Kougioumtzis et al., 2011). Non-exam subjects have a low status within the education system; thus, it can be assumed that they are essentially outside the central functioning of the school (Hendry, 1975, p.6, cited in Kougioumtzis et al., 2011). In some schools, physical education courses and teachers are defined as less important or marginal to the main purpose of the school (Gaudreault et al. 2018). While disciplines that require mental effort, such as mathematics and science, are considered more academically challenging, subject areas such as physical education, arts, and music are structured as less challenging and considered insignificant in terms of the primary mission of the school (Richards et al., 2014). When exam success is the key focus, students are steered towards Math and Science courses. It is not unusual in schools that almost no time is allocated to courses that support students' physical and spiritual development, such as art, music, and physical education. It can be inferred that this situation causes parents to prioritize courses and teachers according to their importance.

Mattering to Other Teachers

The study addressed prospective teachers' expectations regarding the extent to which they would matter to other teachers. Participants stated that they expected to matter to their colleagues simply because they would be colleagues, collaborate, become effective teachers, share the workload, and be newly appointed. Evidence from the literature supports this finding. The feeling of mattering is one of the main factors in reducing the feelings of marginalization (Richards et al., 2017). The acceptance of a newly appointed teacher by colleagues at school will lead them to see themselves as individuals and professionals, fostering a sense of belonging to the school (Özgan, 2013). Teachers working in the same school are colleagues who aspire to achieve the goals of the same organization in the same context (Van Maele & Van Houtte, 2009). Solidarity among teachers is defined as teachers from different generations coming together and contributing to each other's professional development. Teachers feel stronger when they are supported by their administrators and colleagues (Sağlam, 2024). In fact, it has been identified that collegiality is important for school counselors, who provide mental health services, to cope with psychological problems such as stress and burnout (Çoban, 2005). Some of the benefits of collegiate learning are listed as learning new methods and techniques, sharing experiences, collaboration, support, motivation, self-awareness, and gaining different perspectives (Yeşilyurt & Göksoy, 2023). This study revealed that prospective school counselors' expectations to matter focused on collaboration with colleagues. Delivery of effective and efficient mental health services in schools is possible if all stakeholders, especially teachers, believe in the importance of GPC services and work in collaboration. This is considered a key factor in the expectations of prospective school counselors to matter to their colleagues. When prospective teachers matter to colleagues, it ensures the exchange of professional knowledge and skills. It also makes it easier to overcome possible challenges in the early days of teaching. Prospective teachers in the study expected to matter to their colleagues in schools where they would work and have a positive relationship with others. This can be interpreted as an indication that prospective teachers experienced cooperative school environments during their internship.

Participants who stated that they would not matter or would partially matter to other teachers cited prejudices, negative attitudes, being perceived as inexperienced, and the routinization of meeting new teachers as the reasons. Especially, prospective physical education teachers and school counselors mentioned that their colleagues may have a prejudiced attitude. The existing body of literature supports this finding. In studies conducted with school counselors, insufficient cooperation between teachers, ineffective teaching approaches, unrealistic expectations and perceptions of teachers (Yorğun, Mert, & Köksal, 2019), and teachers not providing sufficient support for guidance services (Tuzgöl Dost, 2020) have been listed among

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the problems experienced in schools. In addition, school counselors sometimes face difficulties or prejudices because they do not teach a course like other teachers (Kurnaz & Bozkurt, 2022). Physical education teachers also face challenges in the field of education (Richards et al., 2023) and feel the need to constantly prove themselves when they compare their performance to that of other teachers in the school (Richards et al., 2018). Participants from all disciplines had an expectation that teachers close to retirement would not value young teachers and that, other than group teachers, teachers would not value each other and new teachers. However, education is a process in which all teachers must work with a common understanding and in collaboration. The lack of common understanding and collaboration makes it difficult for teachers to feel a sense of belonging to the school and to work for its common goals.

Mattering to Administrators

The study addressed on the expectations of the prospective teachers and prospective school counselors regarding the extent to which they would matter to their administrators. The participants stated that they expected to matter because they were idealistic teachers, would contribute to the school, serve as colleagues, share the workload with empathy, and because of the importance of their discipline. The prospective teachers defined an idealistic teacher as someone who was hardworking, disciplined, easygoing, someone who performed their job properly, was open to development and learning, respectful, cooperative, committed to professional ethics, and contributed to the school's and student success. They believed that they could contribute to the school by directing students to sports activities, enhancing student success, and working in collaboration with administrators to solve the problems of the students. Prospective Turkish teachers expected that their courses would be valued because of their involvement in organizing school activities, while prospective math and science teachers expected that their courses would be valued because of their weight in exams. Prospective physical education teachers expected that their courses would be valued as they would prepare students for sports competitions, and participants in the GPC discipline expected that their discipline would be valued as they would try to solve students' problems. All prospective teachers and prospective school counselors believed that their administrators would approach them with empathy and value them because they had once been teachers themselves. Similar findings have been reported in the literature. Prospective teachers expect their administrators to engage in healthy communication with them, protect their rights, share their feelings (Özgan, 2013), value their opinions, get to know them, and encourage collaboration among teachers (Yeşilbaş Özenç & Başaran, 2024), as the perceived support of administrators can have a positive or negative effect on employee motivation (Yıldız, 2021). It can be stated that prospective teachers who believed they would contribute to the school had a high perception of mattering in this study. In addition, prospective teachers had the perception that they would matter when they could engage in healthy communication with their administrators and share their problems.

Participants with the expectation to matter partially stated that their expectations of mattering were low due to the indifference of administrators, being seen as inexperienced, and facing prejudices. Similar findings have been reported in the literature. In a study conducted by Kurnaz (2023) in which he examined the mutual expectations and problems of school counselors with school administrators, teachers, and parents, it was found that school counselors valued interaction and cooperation and believed that negative attitudes and prejudices should be changed. Similarly, unrealistic expectations of administrators towards school counselors/guidance teachers (Yorğun et al., 2019) and inadequate support (Tuzgöl Dost, 2020) were mentioned among the problems. Young teachers may feel that they do not matter to their administrators due to factors such as the large number of teachers in the school, employment of teachers with different statuses (e.g., permanent, contracted), administrators' indifference, and prejudices against some disciplines.

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General Expectation of Mattering

The study also addressed how the value they expected in the school environment would affect prospective teachers and prospective school counselors. Participants stated that mattering would increase their motivation, personal development, productivity, and job satisfaction. Self-determination theory suggests that when people's basic psychological needs are met, their psychological health will improve, and symptoms of depression, anxiety, and somatization will decline (Ryan et al., 2008). Mattering is a basic need and enhances individuals' well-being. Teachers' perceived success or failure is usually based on the strength of their relationships with students and their ability to guide students throughout the learning process. When teachers feel that they matter to their schools or students, they see their relationships, and therefore themselves, as successful (Campell, 2016). Uras and Kunt (2006) have found that education faculty students are optimistic about their professions and hope that their expectations regarding "being proud of the profession" and "enjoying the work done" will be met at a high level.

The majority of prospective teachers and school counselors stated that, in the case of anti-mattering, they would find an alternative route without giving up and developing negative feelings, while some noted that they would experience negative feelings, become demotivated, have their ideals undermined, and see a decline in productivity. These findings are consistent with those reported in the literature. Job satisfaction affects the emotional and physical well-being of individuals (Ducharme & Martin, 2000). Studies show that if prospective teachers' expectations from the profession are not met, their motivation and productivity may decline (Uras &Kunt, 2006). Kılıç (2022) has identified three sub-themes under the main theme of future expectations from the profession, namely professional, social, and economic expectations. Professional expectations are listed as professional development, work environment, academic progress, raising well-equipped students, and passion for the profession. Social expectations include shaping the future, social status and healthy communication, and economic expectations include salary. If some of these expectations are not met, individuals may perceive that they do not matter, and therefore, they may experience professional dissatisfaction and unhappiness. One of the most significant findings of this study was that prospective teachers and school counselors stated they would be upset for a while if they did not matter, but would continue their profession by finding alternative routes, which indicates that they have strong hopes for practicing their profession. Snyder (2002) defines hope as a way of thinking in which individuals see themselves as having the ability to create, activate, and continuously use the routes leading to their desired goals. When an individual encounters hurdles in attaining a goal, the idea of alternative routes enables them to formulate new solutions and to reach the goal (Snyder, 2005). In addition to the individuals seeing themselves as competent in a certain task, the task must also have value for them (being interesting, useful, and important, etc.) (Wigfield & Tonks, 2002). Prospective school counselors particularly emphasized that if they did not matter to administrators, colleagues, and parents, they would focus on their relationships with students and pay attention to the student's development and performing their jobs better. This study revealed that teaching and counselling were important for the participants. In their longitudinal study, Bümen and Ercan Yıldız (2013) determined that prospective teachers' self-efficacy beliefs increased significantly throughout their undergraduate education and that participants still had high self-efficacy beliefs at the end of their first year of teaching. Furthermore, research has indicated that individuals who chose teaching as a profession, despite its limited benefits, emphasized intrinsic factors such as their passion for the profession (Papanastasiou & Papanastasiou, 1997) and that prospective teachers who considered teaching as the ideal profession for themselves had high expectations from the future (Bursal & Buldur, 2016). The study has revealed that the most important expectation of guidance and psychological counseling of the students' future was job security (Ulutaş & Güney, 2019), that most of them wanted to be employed in schools

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and work as school counselors (Asarlı & Külahoğlu, 2022; Görgülü & Demirtaş Zorbaz, 2024), and that the job satisfaction of GPC graduates working in schools was significantly higher than those working in other institutions (Helvacı et al., 2023). In this study, the majority of the participants stated that teaching and counselling were their ideal professions, that they put a lot of effort into mastering this profession and that they could perform their profession effectively. Therefore, they stated that they would strive to continue their profession even if they were not valued as they expected. Prospective teachers and prospective school counselors are determined to practice their profession, which can be explained by the investment model (Van Dam, 2005). Participants have spent time and exerted efforts to learn their profession, and have economic, social, and emotional expectations. They have expectations about their work environment, the salary, and the pleasure they will get while practicing their profession. Therefore, they want to get a return on their investment.

Conclusions and Implications

Prospective teachers and prospective school counselors have been in schools during the last year of their education. They engage in communication with students, parents, other teachers, and administrators during the internship. As a result of observations and practices, they have some expectations about how much they will matter to the stakeholders in the school after they start working as a teacher or a counselor and how mattering may affect their professional motivation.

In this study, the expectations of prospective teachers and prospective school counselors about how much they matter to their stakeholders in the school and how this expectation of mattering may affect their professional motivation were examined in detail with a semi-structured questionnaire. In the study, a case study design was employed, and the data of 57 prospective teachers from different disciplines volunteering to participate were analyzed using content analysis.

Participants expected to matter to students and their parents due to their effective teaching attitude, as well as the perceived importance of their disciplines, and their strong communication skills. Participants expected to matter to other teachers and administrators because of factors such as being colleagues, cooperating, contributing to the school, and the perceived importance of their disciplines. The education system in Türkiye is largely evaluated based on students' performance in standardized exams. For this reason, success-oriented students and their parents prioritize teachers of Math and Science and Turkish Language and Literature courses due to their greater weight in exams. On the other hand, it is a fact that conscious students and parents consider courses such as English, art, and physical education important as well. Participants were expected to matter to other teachers and administrators also because they would fulfill their duties, cooperate with them, and contribute to the school. Participants who expected not to matter or to partially matter to students and parents listed reasons such as their disciplines being considered unimportant, the decrease in societal respect for teachers, the changes in student and parent profiles, and being perceived as inexperienced. The decreasing respect for the teaching profession leads students and parents to act toward teachers with a lack of empathy and increased anger in their words and behavior.

Participants who expected not to matter or to partially matter to their colleagues and administrators listed the prejudices against their disciplines and being perceived as inexperienced as the reasons. Those who expressed prejudices against their disciplines were generally prospective teachers from the disciplines of art, physical education, and psychological counseling. Participants stated that a sense of mattering would increase their motivation, personal development, productivity, and job satisfaction. Some participants stated that in case of anti-mattering, they would experience negative feelings, loss of motivation, damage to

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their ideals, and a decrease in productivity, while the majority stated that they would find an alternative route without getting trapped by negative feelings and would strive to perform their jobs in the best way possible. This study is important in terms of revealing the perceptions and expectations of prospective teachers and school counselors regarding their professions and their ability to cope with possible difficulties they will encounter in the school environment. The study contributes to literature by revealing the prejudices against some disciplines in society and the education system.

Mattering to students, parents, other teachers, and administrators at school is highly important for future teachers and school counselors. It can be stated that the more prospective teachers and prospective school counselors feel that they matter in the school environment, the happier and more productive they are.

Recommendations

This study was conducted with the participation of students from teacher training faculties and departments at a university located in the Western Black Sea Region in Türkiye. In future studies, data can be collected from universities located in different regions, and a larger sample can be included.

A quantitative dimension can be added to the study to examine the relationship between prospective teachers' and prospective school counselors' expectations of mattering and their life satisfaction, subjective well-being, self-esteem, hope, and distress.

A longitudinal study can be designed to examine the relationship between prospective teachers' and prospective school counselors' expectations before graduation and the reality shock they experience after starting to work.

Since school counseling is a different discipline from teaching, the expectation of school counselors to matter to educational institutions of different types and levels can be investigated.

21st century skills and competencies underline that students need to develop themselves in different areas. Art, music, physical education, and psychological counseling are areas that support these skills. It would be especially useful to organize training sessions and seminars to raise awareness among families about these competencies.

Teachers and school counselors have a key role in raising healthy, successful, and productive individuals. This aspect can be underlined in education policies, and the societal respect for teachers and school counselors can be addressed.

Note

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References

Alp, İ.,&Levent, F. (2020). Dijital dönüşümün öğrencilerin değerleri üzerindeki etkisine ilişkin öğretmen görüşleri [Teachers' opinions on the effect of digital transformation on students' values]. *Turkish Studies, 15*(3), 1611–1633. https://dx.doi.org/10.29228/TurkishStudies.37035

Asarlı, Z. & Önder Külahoğlu, Ş. (2022). Rehberlik ve Psikolojik Danışmanlık (PDR) lisans programında okuyan öğrencilerin mesleki gelecek algılarının kariyer uyumu açısından incelenmesi [An analysis of the psychological counseling and guidance undergraduates' professional future perspective with regard to career compatibility]. *Journal of Social and Humanities Sciences Research, 9*(82), 890–915. http://dx.doi.org/10.26450/jshsr.1744

Atabek-Yiğit, E.&Balkan-Kıyıcı, F. (2019). Öğretmen adaylarının öğretmen algısı [Teacher candidates' perceptions about teacher]. *Muğla Sıtkı Koçman Üniversitesi Eğitim Fakültesi Dergisi* [MSKU Journal of Education], *6*(1), 20–39. https://doi.org/10.21666/muefd.460666

Aziz, A. (2011). *Sosyal bilimlerde araştırma yöntemleri ve teknikleri* [Research methods and techniques in social sciences]. Nobel Akademik Yayıncılık.

Bacanlı,F.& Aslan, A.,M. (2020). Psikolojik danışmanlık ve rehberlik lisans programı öğrencilerinin bu programı tercih nedenlerinin incelenmesi [Examining preference reasons of undergraduate students ın psychological counseling and guidance programme]. *OPUS International Journal of Society Researches, 16*(28). https://doi.org/10.26466/opus.667847

Başar, M., Arslan, S., Günsel,E. & Akpınar, M. (2019). Öğretmen adaylarının uzaktan eğitim algısı [Distance education perceptions of prospective teachers]. *Journal of Multidisciplinary Studies in Education, 3*(2), 14–22. https://dergipark.org.tr/en/pub/jmse/issue/45032/555407

Bursal, M.&Buldur, S. (2016). İlköğretim öğretmen adaylarının meslek tercih nedenleri ve geleceklerine yönelik beklentileri: Karşılaştırmalı bir analiz [Elementary level preservice teachers' career choıce reasons and future expectations: A comparative analysis]. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 16*(2), 351–376. https://doi.org/10.17240/aibuefd.2016.16.2-5000194932

Bümen, N.T & Ercan Özaydın, T. (2013). Adaylıktan göreve öğretmen özyeterliği ve öğretmenlik mesleğine yönelik tutumlardaki değişimler [Changes on teacher self-efficacy and attitudes towards teaching profession from candidacy to ınduction]. *Eğitim ve Bilim, 38*(169), 109–125.

Campbell, J. (2016). *Lıved experıence of matterıng ın teachers: A Phenomenologıcal Inquıry* [Master of arts. The University of British Columbia]. https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/24/items/1.0314347

Creswell, J.W. (2018). *Qualitative inquiry and research design*. Sage Publications.

CoHE (2024). *The Council of Higher Education Higher Educatıon Board license preference wizard*. https://yokatlas.yok.gov.tr/tercih-sihirbazi-t4.php

Curry, J. R., & Bickmore,D. (2012). School counselor induction and the importance of mattering. *Professional School Counseling, 15*(3), 110–122. https://doi.org/10.1177/2156759X1201500301

Çakmak, M., Gündüz, M., & Emstad, A.B. (2018). Challenging moments of novice teachers: survival strategies developed through experiences. *Cambridge Journal of Education*, 1–16. https://doi.org/10.1080/0305764X.2018.1476465

Çakmak, M. & Kayabaşı, Y. (2017). Öğretmen adaylarının öğretmenlik mesleğini seçme nedenlerinin çeşitli değişkenler açısından incelenmesi [An examination of preservice teachers' reasons for choosing teaching as profession in terms of various variables]. *MSKU Eğitim Fakültesi Dergisi, 4*(1), 1–10. https://doi.org/10.21666/muefd.332430

Çoban, A. E. (2005). Psikolojik danışmanlar için meslektaş dayanması [Colleague support for psychological counselors]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 1*(1), 167–174.

Davey, L. (2009). The application of case study evaluations (T. Gökçek, Trans.). *Elementary Education Online, 8*(2), 1–3. (Orijinal article has been published in Practical Assessment, Research & *Evaluation* in 1991).

Demirtaş, H., Cömert, M. & Özer, N. (2011). Öğretmen adaylarının özyeterlik inançları ve öğretmenlik mesleğine ilişkin tutumları [Pre-service teachers' self-efficacy beliefs and attitudes towards profession]. *Eğitim ve Bilim, 36*(159), 96–111.

Derin Kılıç, A.&Er, E.(2021). Rehber öğretmenleri ile rehber öğretmen adaylarının özel eğitimde rehberlik ve psikolojik danışma hizmetlerine ilişkin öz-yeterlik algı düzeylerinin incelenmesi [An ınvestigation of the self-efficacy perception levels of school counselors and school counselor candidates regarding guidance and psychological counselling services in special education]. *Akdeniz Üniversitesi Eğitim Fakültesi Dergisi, 4*(2), 26–44.

Dixon Rayle, A. (2006). Mattering to others: implications for the counseling relationship. *Journal of Counseling & Development, 84*, 483–487. https://doi.org/10.1002/j.1556-6678.2006.tb00432.x

Ducharme, L. J., & Martin, J. K. (2000). Unrewarding work, coworker support, and job satisfaction: A test of the buffering hypothesis. *Work and Occupations*, *27*(2), 223–243. https://doi.org/10.1177/0730888400027002005

Duman, S. N., & Taş, İ. D. (2021). Eğitim fakülteli olmak (Kırıkkale Üniversitesi Örneği) [Being a student of education faculty (Sample of Kirikkale University)]. *Ulusal Eğitim Akademisi Dergisi,5* (1), 112–130. https://doi.org/10.32960/uead.898199

Elliott, G., Kao, S., & Grant, A. M. (2004). Mattering: Empirical validation of a social-psychological concept. *Self and Identity, 3*(4), 339–354. https://doi.org/10.1080/13576500444000119

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Euronews (2018). *Araştırma: Türkiye, son 5 yılda öğretmenlerin en çok değer kaybettiği üç ülkeden biri oldu* [Research: Türkiye has been one of the three countries where teachers lost the most in the last 5 years]. tr.euronews.com/2018/11/09/turkiye-de-ogretmenlerin-itibari-erozyona-ugradi-oecd-pisa-testi-varkey-vakfi

Flett, G., L. (2018). *The psychology of mattering: understanding the human need to be significant*. Academic Press.

Gaudreault, K.L., Richards,K.A.R. & Woods, A.M. (2018) Understanding the perceived mattering of physical education teachers. *Sport, Education and Society, 23*(6), 578-590. https://doi.org/10.1080/13573322.2016.1271317

Gençtanırım Kurt, D., Kızıldağ, S., Demirtaş Zorbaz, S., Özer, A. (2015). Psikolojik danışman adaylarının duygusal farkındalık düzeylerinin belirleyicileri [Determiners of prospective candidate psychological counselors' levels of emotional awareness]. *Turkish Psychological Counseling and Guidance Journal, 5*(44), 15-24.

Göker, S. D. & Gündüz, Y. (2017). Dünya ölçeğinde öğretmenlerin saygınlık statüsü ve özlük hakları [Teacher status and their employee personal rights across the world]. *Eğitim ve Bilim*, *213*, 177–196.

Görgülü, Z. & Demirtaş-Zorbaz, S. (2024). Hayaller ve hayatlar: psikolojik danışman adaylarının kariyer istek ve beklentileri [Dreams and realities: career aspirations and expectations of counselor candidates]. *Kariyer Psikolojik Danışmanlığı Dergisi, 7*(2), 116–137. https://doi.org/10.58501/kpdd.1518677

Helvacı, İ., Polat, C., & Terzi, R. (2023). Psikolojik Danışmanlık ve Rehberlik (PDR) bölümü mezunlarının çalıştıkları bakanlıklara göre mesleki doyum seviyelerine etki eden faktörlerin incelenmesi [Assessment of the factors impacting the occupational satisfaction levels of graduates of the guidance and psychological counseling (GPC) program in accordance with the ministries in which they work]. *Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 25*, 257–270. https://doi.org/10.29029/busbed.1212089

Keskin, D. (2012). *Bitmeyen sınavlar yaşanmayan hayatlar* (*Eğitimde paradigma değişimi*) [Endless exams, unlived lives (Paradigm shift in education)]. Dipnot Yayınları.

Kılıç, M.Y. (2022). Öğretmen adaylarının öğretmenlik mesleğini seçme nedenleri, beklentileri ve öğretmenlik programının niteliğinin artırılmasına yönelik görüşleri [Reasons for choosing the teaching profession for teacher candidates, their expectations, and opinions about i ncreasing the quality of the teaching program]. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 56*, 35–65. https://doi.org/10.9779/pauefd.1031456

Klassen, R. M., Perry, N. E.&Frenzel, A. C. (2012). Teachers' relatedness with students: An underemphasized component of teachers' basic psychological needs. *Journal of Educational Psychology, 104*(1), 150–165. https://doi.org/10.1037/a0026253

Korkut Owen, F., & Tuzgöl Dost, M. (2020a). Psikolojik danışman adaylarının mesleğe ilişkin kişisel eğilimleri [Investigating professional dispositions of counselor candıdates]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* (*53*), 83–110. https://doi.org/10.21764/maeuefd.620671

Korkut Owen, F. &Tuzgöl Dost,M. (2020b). Psikolojik danışman adaylarına göre etkili psikolojik danışmanın özellikleri ve psikolojik danışman eğitiminin etkisi [Psychological counselor candidates opinions about effective psychological counselors and effectiveness of psychological counselor education]. *IBAD Sosyal Bilimler Dergisi,* (8), 259–274. https://doi.org/10.21733/ibad.728147

Kougioumtzis, K., Patriksson, G., & Stråhlman, O. (2011). Physical education teachers' professionalization: A review of occupational power and professional control. *European Physical Education Review*, *17*(1), 111–129. https://doi.org/10.1177/1356336X11402266

Kurnaz, Ö. (2023). *Expectations and problems of school psychological advisorswith school administrator, teacher and parents* [Master's thesis, Amasya University]. https://tez.yok.gov.tr/UlusalTezMerkezi/

Kurnaz, Ö. & Bozkurt, E. (2022). Okul idaresi ve öğretmenlerin psikolojik danışmanlara bakış açıları [School administration and teachers' perspectives to psychological counselors]. *Eğitim ve Öğretim Araştırmaları Dergisi, 11*(2), 76–83.

Külünkoğlu, T. (2017). Ortaokul öğretmenlerinin öğretmene saygı değerine ilişkin görüşleri [Secondary school teachers vıews related to teacher's respect]. *Asya Studies*, 1-11-22.

Liu, W., Gamble, J. H., Cao, C. H., Liao, X. L., Chen, I. H., & Flett, G. L. (2023). The General Mattering Scale, the Anti-Mattering Scale, and the Fear of Not Mattering Inventory: Psychometric properties and links with distress and hope among chinese university students. *Psychology Research and Behavior Management*, *16*, 4445–4459. https://doi.org/10.2147/PRBM.S430455

Marshall, S. K. (2001). Do I matter? Construct validation of adolescents' perceived mattering to parents and friends. *Journal of Adolescence*, *24*, 473–490. https://doi.org/10.1006/jado.2001.0384

Matera, C., Bosco,N.& Meringolo, P. (2020). Perceived mattering to family and friends, self-esteem, and well-being. *Psychology, Health & Medicine, 25*(5), 550–558. https://doi.org/10.1080/13548506.2019.1626454

Miles, M, B.,& Huberman, A. M. (1994). *Qualitative data analysis: An expanded Sourcebook*. Sage.

MoNE (2013). *Ministry of National Education Secondary Education Institutions Regulation.* https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=18812&MevzuatTur=7&MevzuatTertip=5

MoNE (2014). *Ministry of National Education Preschool Education and Primary Education Institutions Regulation.* https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=19942&MevzuatTur=7&MevzuatTertip=5

MoNE (2020). *Ministry of National Education Guidance and Psychological Counseling Services Regulation*. https://www.resmigazete.gov.tr/eskiler/2020/08/20200814-2.htm

ÖSYM (2011). *Türkiye Cumhuriyeti Ölçme Seçme ve Yerleştirme Merkezi tanıtım bülteni* [Republic of Türkiye Centre for Assessment, Selection and Placement promotion bulletin]. https://www.osym.gov.tr/TR,25533/tanitim-bulteni.html

Özgan, H. (2013). Stajyer öğretmenlerin sosyalleşme sürecinde okul yöneticilerinden beklentileri [Trainee teachers' expectations from school administrators during their socialization processes]. *Eğitim ve Bilim, 38*(168), 17–29.

Özsoy, G., Özsoy, S., Özkara, Y. & Memiş, A.D. (2010). Öğretmen adaylarının öğretmenlik mesleğini tercih etmelerinde etkili olan faktörler [Factors affecting pre-service teachers' choice of teaching as a profession]. *İlköğretim Online, 9*(3), 910–921.

Öztürk, M. & Yıldırım, A. (2013). Adaptation challenges of novice teachers. *Hacettepe University Journal of Education, 28*(1), 294–307.

Papanastasiou, C., & Papanastasiou, E. (1997). Factors that influence students to become teachers. *Educational Research and Evaluation, 3*(4), 305–316. https://doi.org/10.1080/1380361970030402

Pehlivan, K. B. (2015). Öğretmen adaylarının iletişim becerisi algıları üzerine bir çalışma [A study on perception of communication skills of preservice teachers]. *İlköğretim Online, 4*(2), 17–23.

Polat,Ü., Kaysılı, A., & Aydın.Ş. (2015). Öğretmen adaylarının eğitimsel, toplumsal ve siyasal beklentileri üzerine bir araştırma [A study on the educational, social and political expectations of the preservice teachers]. *Cumhuriyet International Journal of Education-CIJE, 4*(2), 1–14. https://doi.org/10.30703/cije.321365

Rayle, A. D. (2006). Do school counselors matter? Mattering as a moderator between job stress and job satisfaction. *Professional School Counseling*, *9*, 206–215. https://doi.org/10.5330/prsc.9.3.w23j476w45727537

Richards, K. A. R., Gaudreault, K. L., & Woods, A. M. (2017). Understanding physical educators' perceived matteirng: Validation of the perceived mattering questionnaire-physical education. *European Physical Education Review, 23*(1) 73–90. https://doi.org/10.1177/1356336X1663732

Richards, K. A. R, Hemphill, M. A., Shiver, V. N., Gaudreault, K. L., & Ramsey, V. (2023). Teaching physical education in an urban intensive environment. *Urban Education*, *58*(8), 1745–1771. https://doi.org/10.1177/0042085920923019

Richards, K. A. R., Templin, T. J., & Graber, K. (2014). The socialization of teachers in physical education: Review and rec-ommendations for future works. *Kinesiology Review*, 3, 113–134. https://doi.org/10.1123/kr.2013-0006

Rosenberg, M., & McCullough, B. C. (1981). Mattering: Inferred significance and mental health among adolescents. *Research in Community and Mental Health*, *2*, 163–182.

Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on Self-Determination Theory. *The European Health Psychologist*, *10*, 2–5.

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IN THE 21st CENTURY
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Sandıkçı, M. (2011). *The attitudes and self-efficiency perceptions of nominee teachers in physical education and other branches* [Master's thesis, Karadeniz Teknik Üniversitesi]. https://tez.yok.gov.tr/UlusalTezMerkezi/

Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry, 13*(4), 249–275.

Snyder, C. R. (2005). Teaching: The lessons of hope. *Journal of Social and Clinical Psychology, 24*(1), 72–84.

Spencer, L.,&Ritchie, J.(2012). In pursuit of quality. In D. Harper & A.R. Thompson (Eds.), *Qualitative research methods in mental health and psychotherapy* (pp. 225-242). Willey -Blackwell.

Strayhorn, T. L. (2012). *College students' sense of belonging:A key to educational success for all students.* Routledge

Şengül Bircan, T., (2024). Sosyal bilgiler ve tarih öğretmen adaylarının "öğretmenlik uygulaması dersi"ne ilişkin tutumları ve değerlendirmeleri [Social studies and history teacher candidates' attitudes and evaluations towards the "teaching practice course"]. *Premium e-Journal of Social Science, 8*(43), 794–803. https://doi.org/10.5281/zenodo.12603827

Taylor, J., & Turner, R. J. (2001). A longitudinal study of the role and significance of mattering to others for depressive symptoms. *Journal of Health and Social Behavior, 42*(3) 310–325.

Tschannen-Moran, M. & Gareis, C. R. (2015). Principals, Trust, and cultivating vibrant schools. *Societies, 5*(2), 256–276.

Tunca, N. Şahin,S.A. & Aydın, Ö. (2015). Öğretmen adaylarının yaşam boyu öğrenme eğilimleri [Life-long learning tendencies of pre-service teachers]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 11*(2), 433–446. https://doi.org/10.17860/efd.92694

Tunç, E., & Tunç, M. F. (2022). Rehber öğretmenler ile psikolojik danışman adaylarının kariyer adanmışlıkları ve kariyer kararı pişmanlıkları [Career commitment and career decision regret of counselor and counseling candidates]. *Kariyer Psikolojik Danışmanlığı Dergisi, 5*(2), 34–50. https://doi.org/10.58501/kpdd.1108991

Tuzgöl Dost, M. (2020). Okul psikolojik danışmanlarına göre ilkokullardaki rehberlik ve psikolojik danışma hizmetlerinin durumu ve sorunları [The state and problems of psychological counseling and guidance services in primary schools according to school counselors]. *Elektronik Sosyal Bilimler Dergisi, 19*(76), 1673–1690. https://doi.org/10.17755/esosder.715029

Tünkler, V. (2021). Sosyal Bilgiler öğretmen adaylarının öğretmenliğe yönelik motivasyonları: beklenti-değer modeli [Preservice socıal studies teachers' motivations to teaching: An expectancy-value model]. *Türkiye Sosyal Araştırmalar Dergisi,25*(2), 581–594.

Uğur,E., Düşünceli, B.&Demir, S. (2023), Psikolojik danışmanlık ve rehberlik lisans programının tercih edilme nedenlerinin incelenmesi [Examining the preference reasons for psychological counseling and guidance undergraduate program]. *Journal of Education for Life, 37*(3), 800–813. https://doi.org/10.33308/26674874.2023373579

Ulutaş, B. ve Güney, E. (2019). Rehberlik ve psikolojik danışmanlık alanı öğrencilerinin gelecek beklentileri: Bir durum çalışması. *Journal of Qualitative Research in Education, 26*, 292–314.

Uras, M.&Kunt, M. (2006). Öğretmen adaylarının öğretmenlik mesleğinden beklentileri ve beklentilerinin karşılanmasını umma düzeyleri [Teacher candidates' expectations from the teaching profession and their level of hope that their expectations will be met]. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 19*(1), 71–83.

Ünsal,S., Çetin, A. & Yüksek, F. (2022). 2005 yılı öncesi ve sonrası öğretmen öğrenci ve veli profillerine ilişkin öğretmen görüşlerinin belirlenmesi [Investigating the teachers' views on the pre- and post-2005 teacher, student and parent profiles]. *Kocaeli University Journal of Education, 5*(1), 51–70. https://doi.org/10.33400/kuje.1035236

Van den Broeck, A., Vansteenkiste, M., De Witte, H., & Lens, W. (2008). Explaining the relationships between job characteristics, burnout, and engagement: The role of basic psychological needs satisfaction. *Work and* Stress, *22,* 277–294. https://doi.org/10.1080/02678370802393672

Van Maele, D., & Van Houtte, M. (2009). Faculty Trust and organizational school characteristics: an exploration across secondary schools in Flanders. *Educational Administration Quarterly*, *45*(4), 556–589. https://doi.org/10.1177/0013161X09335141

Van Dam, K. (2005), Employee attitudes toward job changes: An application and extension of Rusbult and Farrell's investment model. *Journal of Occupational and Organizational Psychology*, *78*, 253–272. https://doi.org/10.1348/096317904X23745

Varkey Foundation (2018). *GlobalTeacher Status Index***,** *TURKEY GTSI STATISTICS* https://www.varkeyfoundation.org/global-teacher-status?pgid=m10kr4au3-353b02bd-22de-4ba6-a3ab-21d79fb8ddc3

Viernes, R. M. & Guzman, A. B. (2005). Filipino teachers' experiences of supportive relationships with colleagues: A narrative-biographical inquiry. *Asia Pacific Education Review, 6*(2), 137-142. https://doi.org/10.1007/BF03026781

Wang, H. & Prihadi, K.D. (2022). What makes locked-down students happy: The sense of mattering and subjective well-being. *International Journal of Evaluation and Research in Education, 11*(1), 201–206. http://doi.org/10.11591/ijere.v11i1.22578

Wigfield, A., & Tonks, S. (2002). Adolescents' expectancies for success and achievement task values during the middle and high school years. In F. Pajares & T. Urdan (Eds.). *Academic motivation of adolescents* (pp. 53-82). Information Age Publishing.

Wininger, S. R., & Birkholz, P. M. (2013). Sources of ınstructional feedback, job satisfaction, and basic psychological needs. *Innovative Higher Education*, *38*, 159–170. https://doi.org/10.1007/s10755-012-9229-9

Yeşilbaş Özenç, Y. & Başaran, R. (2024). Öğretmenlerin okul yöneticilerinden beklentileri [Teachers' expectations from school administrators]. *Buca Eğitim Fakültesi Dergisi, 61*, 2297–2325. https://doi.org/10.53444/deubefd.1459886

Yeşilyurt, R.&Göksoy, S. (2023). Eğitim kurumlarında meslektaş öğrenmesi [Collective learning in educational institutions]. *Uluslararası Liderlik Eğitimi Dergisi (ULED), 7*(1), 68–88. https://trdoi.org/10.26023458/uled.1314589

Yıldırım, A. ve Şimşek, H. (2013). *Sosyal bilimlerde nitel araştırma yöntemleri* [Qualitative research methods in social sciences]. Seçkin Yayıncılık.

Yıldız, M. (2021). *Perceived executive support in developing a sense of institutional belonging in industrial institutions* [Master's thesis. Bandırma On Yedi Eylül Üniversitesi]. https://tez.yok.gov.tr/UlusalTezMerkezi/

Yorğun, A. Mert, S. & Köksal, G. (2019). Okul yöneticileri ve okul psikolojik danışmanları perspektifinden okul psikolojik danışmanlık ve rehberlik hizmetlerinin incelenmesi [The investigation of the the school counseling services from the perspective of school counselor and administrators]. *Okul Psikolojik Danışmanlığı Dergisi, 2*(2), 166–198.

YÖK (2024). *Yüksek Öğretim Kurulu lisans tercih sihirbazı* [Hıgher Educatıon Board license preference wizard] https://yokatlas.yok.gov.tr/tercih-sihirbazi-t4.php

Zırıh, S. (2023). *An investigation of Turkish teacher candidates' motivation to practice the teaching profession in the scope of expectation-value theory* [Master's thesis, Kars Kafkas Üniversitesi]. https://tez.yok.gov.tr/UlusalTezMerkezi/

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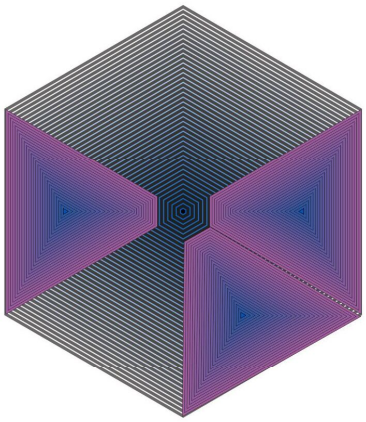

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